National SAFETY NEWS

MAY 1957

This issue contains a special Technical Feature Section

The Journal

of the AMERICAN SOCIETY OF SAFETY ENGINEERS

AROUND THE CORNER

IN THIS ISSUE

If You Sell to Uncle Sam
What They Wear Keeps Them Safe
Sources of Information on Nuclear Energy

Beat Warm Weather's Perspiration Hazards BOTH WAYS—with these M-S-A® items

Absorb the sweat... Replace the salt

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EDITORIAL

"Do It Yourself!"

DO-IT-YOURSELF activities have been popular in this country for years and are gaining steadily in popularity. Of course, there are occasions when it is safest and most economical to hire an expert, but self-reliance has always been a characteristic of our American civilization.

One place we need more of the "do it yourself" idea is in the traffic safety movement.

There are many people who wonder what is being done to prevent accidents in our state — and, of course, many things are being done in an official way. At all government levels—state, county and local—we have programs of traffic engineering, enforcement and education in continuous operation.

All of us have an interest and responsibility in assuring the continuance and expansion of official efforts to prevent accidents. This responsibility is being recognized on a country-wide scale this year, and a national campaign to "Back the Attack on Traffic Accidents" is under way. We are being asked to give full support to official activities and programs which are intended to prevent accidents.

But with all the effective work that can be done officially in the fields of engineering, enforcement and education, there remains a vast field of endeavor in which we ourselves must take full responsibility as individuals. We as individual car owners and drivers must assume proper responsibility.

We must do it ourselves. And we must *do it now*.

Primarily, we must assume responsibility for the condition of our own cars—for brakes and lighting equipment, for the cleanness of windshield and windows, for the dependability of tires. Some of us are thoughtful enough to take extra important precautions, such as installing safety seat belts and using reinforced tire chains on slippery winter pavements.

We must recognize, of course, that there is a limit to "do it yourself" projects with respect to the condition of our cars. Periodically we need the help of professional mechanics, but it is our personal responsibility to see that the car is exposed to expert inspection from time to time, and that needed repairs are made.

But even more important than the mechanical condition of the car we drive are our own qualifications as a driver. Officially, many of us passed a physical examination of sorts when we first began to drive. At least our eyes were tested.

But since that time have we made sure, periodically, that our vision is up to par? Again, professional advice must be depended upon, but the original responsibility rests with us. And do we keep ourselves mentally alert when driving?

No one else can do that for us.

—*From* A-C VIEWS, *Allis-Chalmers Manufacturing Company.*

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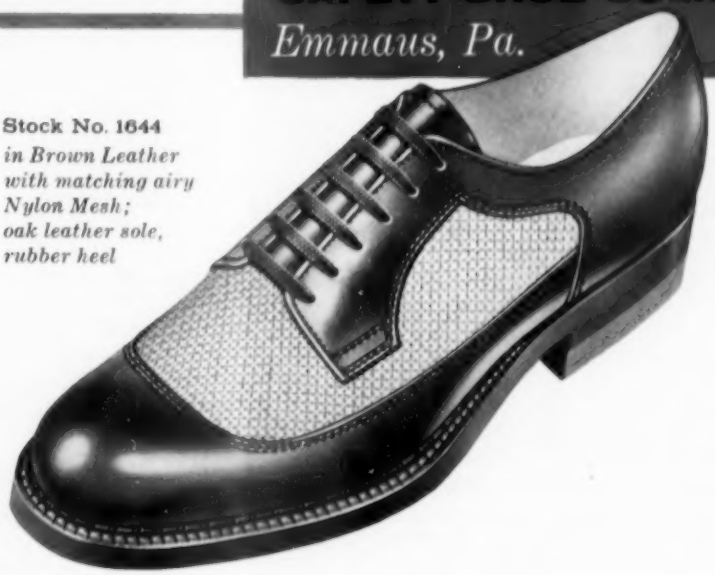

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THE SAFETY VALVE

Nothing human is alien to me

—TERENCE

Safer Churches

SINCE THE article, "How Safe Is Your Church?" by Prof. C. O. Jackson appeared in the NEWS last spring reports have been coming in on church safety activities in various parts of the country. In most instances the inspiration has come from an industrial safety man.

The word *man*, it should be noted, is used in the generic sense. One of the active missionaries in the cause of making churches safer is a woman, Mrs. Hazel Leedke, R. N., of Kaukauna, Wis. Long active in the safety program of the Thilmany Pulp and Paper Company which she serves as nurse, her interests extend to the community. As a member of the local Methodist Church, she has inspired several projects to make the property safer.

Latest activity was a fire drill for the Sunday School supervised by the fire department.

In the Crystal Ball

LOOKING into the exciting days of push-button living which are supposed to be just around the corner is a favorite sport for writers who feel they have the gift of prophecy.

Just a few evenings ago the *Chicago Daily News* Columnist Jack Mabley (just elected president of the suburban village of Glenview) gave us a picture of life as it may be in 1975. If I live to within 10 years of my dad's present age (he was 95 last December) I'll be around to see these miracles. And I'm viewing them with even less enthusiasm than Mabley.

A hundred electronic gadgets will run our home sweet air-conditioned home. (Think of the repair bills!)

Two-way wrist radios, now the monopoly of Dick Tracy of the comic strip, will be as common as wrist watches.

We'll travel across the continent in hours in flying saucers. Giant underground conveyor belts will carry goods and people.

As for television, we haven't seen anything yet. The TV of the future will have pictures on the walls of every room. But, he adds, "the content of this magnificent electronic picture is, of course, getting steadily worse."

The housewife's load will be lightened by chemicals which will eliminate dirt and therefore cleaning. Offsetting this boon, Mabley points out, is the fact that the increase in mental ailments has been in direct ratio to the increase in her spare time.

As for traffic, he anticipates cars of 500-600 horsepower, doubling of today's acceleration, and speeds that will insure that a crash will be as final in an auto as it is in an airplane. (After all, we can expect just so much of seat belts and guardian angels.)

And then there's the specter of atomic energy which will revolutionize our sources of machine power and also may blow us off the face of the earth.

The four-day week is also looming on the horizon. But Mabley believes that if present trends of inflation and taxation continue, most men will use the extra day of leisure for an outside job to supplement their regular income.

Mabley doesn't suggest a return to washboards and brooms but he would like to see a tiny portion of science's billions devoted to research in the problems of boredom.

Science invented the treadmill a few centuries ago, he concludes. There have been no changes in the basic design.

Literary Larceny

WHENEVER somebody thinks enough of our stuff to reprint it, we feel flattered—even when they overlook the credit line.

But it's really annoying when an article is credited to some other publication—the one that lifted it from us without credit.

Recently we saw one of our articles in a company magazine reprinted through "courtesy" of another publication. They even used our title, barker and lead.

If a member can use material from the NEWS to help his safety program, it makes us very happy. As far as his own employees are concerned it doesn't make a great deal of difference about giving us credit. But there's always the chance that somebody else may pick it up and attribute it to the wrong party.

That's why we ask for a credit line.

P.S. The above doesn't include jokes.

The Vanishing Nickel

IF YOU CAN REMEMBER the nickel schooner of Pilsener, that dates you. It was one of the casualties of World War I. A non-strangling cigar retailing at the same price is only a memory. The nickel cup of coffee lingered in beaneries without tablecloths but it finally gave up the ghost. It had been growing weaker for some time.

As of today, a nickel will still buy a newspaper in most cities east of the Rocky Mountains. It will also buy a package of gum or an undersized candy bar.

Among the victims of the inflationary spiral are the kids. The fascinating displays of penny sweets at the corner store are gone forever. And some of us remember the penny licorice pipes and plugs of imitation eating tobacco. It made such a rich dark spit—like what the local yokels used to aim at the box of sawdust in the harness shop.

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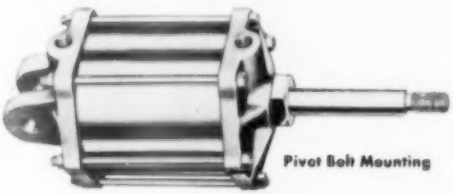
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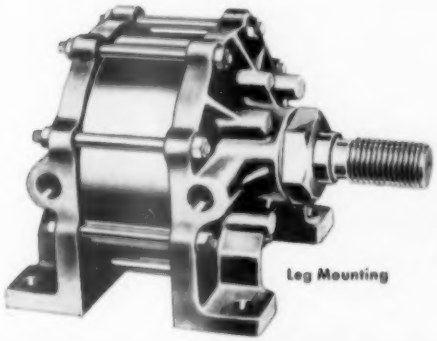
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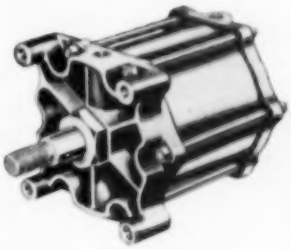
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BOOKS AND PAMPHLETS

Civil Defense

Preparation for Peacetime and Wartime Disaster in Industry. Civil Defender, Box 1641, Mobile, Ala. 1957. 92p. Special Industrial Issue. $1.00.

Radiation

Control of Radon and Daughters in Uranium Mines and Calculations on Biologic Effects. 1957. 81p. Public Health Service Publication No. 494, Occupational Health Program, U. S. Public Health Service, Washington 25, D. C.

Ceramic Industry

The Manufacture of Brick, Tile and Kindred Products. U. S. Bureau of Labor Standards, Washington 25, D. C. 1956. 22p. "Occupational Hazards to Young Workers, Report No. 13."

Chemical Industry

Chemical Industry Fact Book. 3rd edition. Manufacturing Chemists' Association, 1625 Eye Street, Washington 6, D. C. 1957. 148p. $1.25.

Chemicals

Antimony Trichloride (Anhydrous). Manufacturing Chemists' Association, 1625 Eye Street, N. W., Washington 6, D. C. 1957. 12p. "Chemical Safety Data Sheet 5D-66." 30c.

Paper Industry

American Safety Standards for Pulp and Paper Mills. American Standards Association, 70 East 45th Street, New York 17, N. Y. 1957. 18p. ASA - P1.1 - 1956 - Revision, $1.00.

MAGAZINE ARTICLES

Accidents

"You Can Stop Those Freak Accidents." *Factory Management and Maintenance.* Mar. 1957. p. 136-137.

Compressed Air

"Safety in the Compressor Plant." R. J. Nemmers. *Compressed Air Magazine.* Mar. 1957. p. 74-78.

Fire Protection

"Foam-Filled Hose for Confining Spilled Oil at Ports." J. Grindrod. *Fire Engineering.* Mar. 1957. p. 227.

"Panic Blamed for Death of 15 in New Haven Holocaust." *Fire Engineering.* Mar. 1957. p. 224-226.

Health

"Brucellosis As a Cause of Herniated Disk and Spondylitis." Thomas de Villafane Rastra and Joseph Franklin Griggs. *Industrial Medicine and Surgery.* Mar. 1957. p. 122-129.

"Carcinogenicity of Atmospheric Pollutants." Sidney Mittler. *Industrial Medicine and Surgery.* Mar. 1957. p. 135-138.

"Dermatology in Industrial Medicine." Frank C. Combes. *Industrial Medicine and Surgery.* Mar. 1957. p. 145-148.

"How Dermatitis is Controlled in Diesel Shops." *Modern Railroads.* Mar. 1957. p. 103.

"Rocky Mountain Spotted Fever." Edward P. Cawley. *Journal of the American Medical Association.* Mar. 23, 1957. p. 1003-1007.

"Survey of the Occupational Environment." *Industrial Medicine and Surgery.* Mar. 1957. p. 149-155.

"What the Employee Thinks of His Medical Department." William Jend, Jr. *Industrial Medicine and Surgery.* Mar. 1957. p. 113-119.

Hospitals

"The Nurse's Role in Hospital Safety." Harriet L. Aberg. *Nursing Outlook.* Mar. 1957. p. 160-162.

Housekeeping

"Six Keys to Good Housekeeping." Clarence Page. *Supervision.* Mar. 1957. p. 10-11.

Lighting

"Considerations for Emergency Lighting." C. J. Briefer. *Pacific Factory.* Feb. 1957. p. 30-31.

"Many Factors Contribute to Good Illumination." C. M. Holden. *The Plant.* Mar. 1957. p. 47-50.

Mines

"Banner Year at Wheelwright. No Roof Fall Injuries." *Coal Age.* Mar. 1957. p. 64-67.

Radiation

"Engineering Aspects of the Disposal of Radioactive Wastes from the Peacetime Application of Nuclear Technology." Joseph A. Lieberman. *American Journal of Public Health.* Mar. 1957. p. 345-351.

"Medical Aspects of Radiological Health." Seward E. Miller. *Industrial Medicine and Surgery.* Mar. 1957. p. 130-131.

"Radiation Hazards." W. J. Saterfield, Jr. *Best's Insurance News—Fire and Casualty.* Mar. 1957. p. 114-120.

"The Responsibilities of the Medical Profession in the Use of X-Rays and other Ionizing Radiation." *Industrial Medicine and Surgery.* Mar. 1957. p. 132-134.

Waste Disposal

"Newest Way to Get Rid of Combustible Liquids." *Factory Management and Maintenance.* Mar. 1957. p. 107-108.

Welding

"New Welding Process Produces Ozone Hazards—but Can Be Used Safely." *Safety Standards.* Mar.-Apr. 1957. p. 1-3.

ADDRESSES OF MAGAZINES MENTIONED

Readers are asked to send their requests for copies of magazine articles to the publishers, rather than to the NSC Library, which is unable to fill such requests.

American Journal of Public Health, American Public Health Association, 1790 Broadway, New York 19.

Best's Insurance News—Fire & Casualty, Alfred M. Best Co., 75 Fulton St., New York 38.

Coal Age, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36.

Compressed Air Magazine, Phillipsburg, N. J.

Factory Management and Maintenance, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36.

Fire Engineering, Case - Shepperd - Mann Div., 305 E. 45th St., New York 17.

Industrial Medicine and Surgery, 605 N. Michigan Ave., Chicago 11.

Journal of the American Medical Association, 535 N. Dearborn St., Chicago 10.

Modern Railroads, Watson Publications, Inc., 201 N. Wells St., Chicago 6.

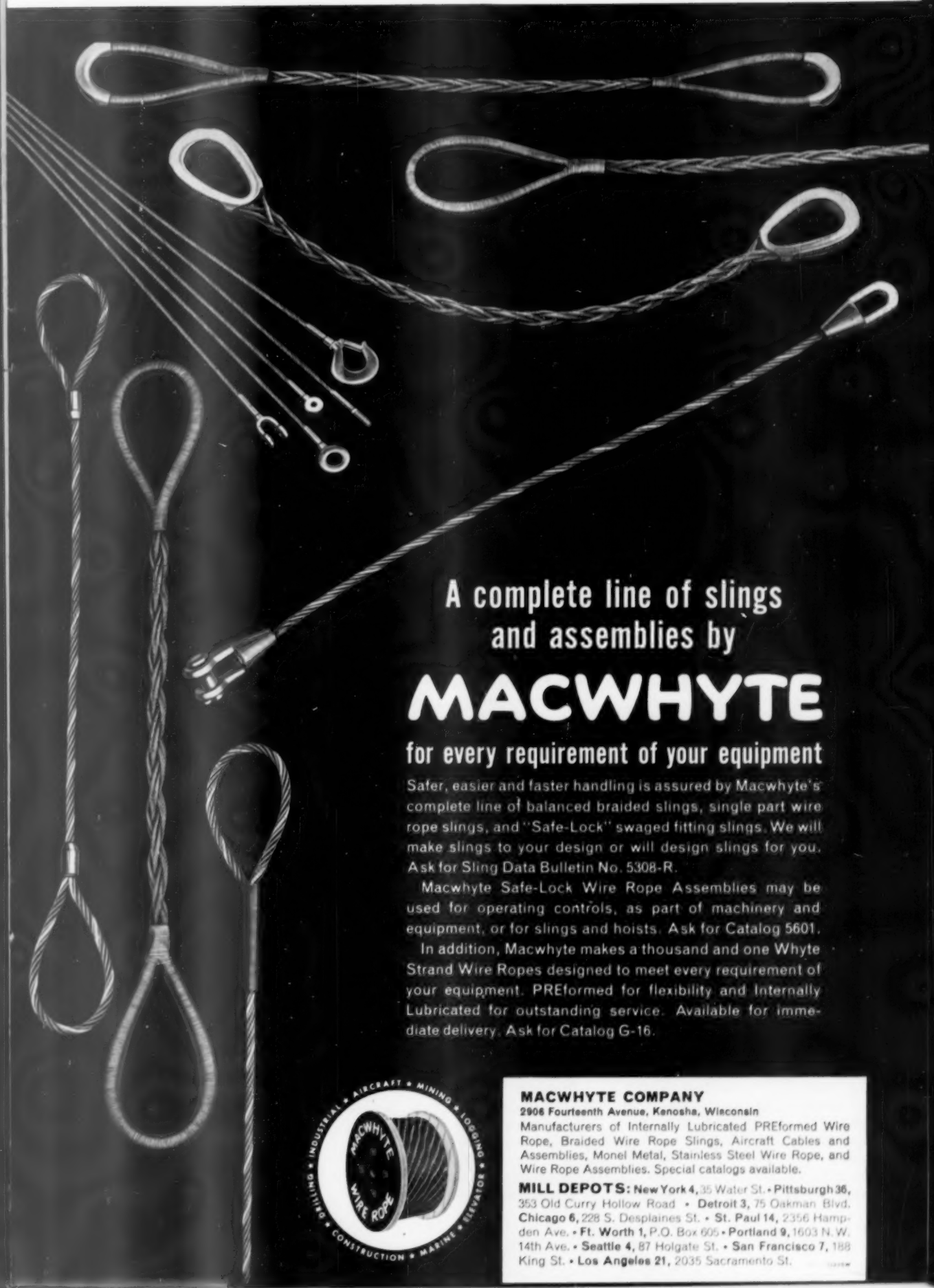
Nursing Outlook, American Journal of Nursing Co., 2 Park Ave., New York 16.

Pacific Factory, 709 Mission St., San Francisco.

The Plant, Plant Publishing Co., St. Joseph, Mich.

Safety Standards, U. S. Bureau of Labor Standards, Washington 25, D. C.

Supervision, 95 Madison Ave., New York 16.



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Voice of the Reader

Let's have your views on current topics. You don't have to agree with us

Disagrees with Film Review

KANSAS CITY, MO. I want to take issue with your review (April 1957 issue) of the safety shoe film, *Margin of Safety*. I thought you were wrong not to give a stronger endorsement.

My guess is that you have never tried to convince a plant worker who wears five or 10 years' seniority, but no safety shoes, that he should shell out 10 bucks for a pair of them. About the only job any tougher is to convince this worker's foreman that *he* should sell the idea to *all* his men. The film did an outstanding job of both, largely because it approached the subject suspiciously, just as this worker and his foreman.

Without being either gory or too high-pressured, the picture did a very realistic job of presenting the need for safety shoes from exactly the same angle that the guy who ought to buy a pair thinks of it.

The movie was previewed by our safety committee, which wholeheartedly recommended that it be shown to all plant personnel. It was, and without the catcalls and clever comments that accompany most safety movies. Sales of safety shoes have increased appreciably since the showing.

As for the fact that the sponsor used his name on the boxes in the selling sequence—this film cost Hy-Test a lot of dough to produce and to loan, not rent, to potential customers. Yet the only two places the name is even mentioned are at the beginning, giving credit for the production, and on some boxes for a period of maybe 60 seconds out of the entire 22 minutes. You'll have to agree that this is far, far less pushing of the product than in most company-sponsored movies. The name Hy-Test was not even used in the sales pitch. You could hardly expect them to use a competitor's product.

I think you did Hy-Test and your readers a disservice by failing to give *Margin of Safety* your hearty recommendation.

—J. W. GILGES

Too Many Scotches?

SANFORD, FLA. I always look forward to "The Diary of a Safety Engineer"—fact is, I think it is the best article the NEWS carries. However, I have a gripe about the installment in the January 1957 issue.

Our hard-working safety man was making his report to the v-p and doing a swell job for my money until he got around to the Scotch and soda. One Scotch so far as I am concerned is too much—three in the few minutes he was in the v-p's office is not for a safety man. Fact is, I don't like any article or story that has to be beefed up with drink.

I still say that the articles which Bill Andrews wrote without drink were the best in the book.

—W. E. GILES, *Safety Division, U.S. Naval Air Station*

Idea for a Poster

ALBION, N.Y. The "Best Things in Life Are Free" by Robert D. Gidel in the April issue is so good it should be put out in poster form.

—R. P. FENTON,
Bemis Bro. Bag Co.

One More "E"

PHOENIX, ARIZ. Over the past decade the original three "E's" of accident prevention have been expanded upon to include additional ones. The more dynamic and progressive accident prevention engineers have recognized the fact that Engineering, Education, and Enforcement alone have not been the only factors upon which to base the success of their programs. My hat goes off to Mr. Brookshire (NATIONAL SAFETY NEWS, October 1956) for being among the first to record two additional ones—Example and Economy.

I cannot help feeling, however, that Mr. Brookshire knows that there is a sixth "E"—Enthusiasm—which he has clearly demonstrated that he believes in, but failed to mention in his article.

A safety engineer has been aptly defined by an unknown author as a combination engineer, preacher, teacher, policeman and salesman. He must have the technical know-how of the engineer, the preacher's desire to assist his fellow men, the teacher's wish to impart useful information, the spirit and courage of the policeman to enforce the right, and the salesman's personality and aggressiveness to offer his product for the use of the world.

Unfortunately, too many times it has been discovered that sound accident prevention programs have been delegated to mere "record keepers" or "accident investigators," thereby endangering the entire structure of an organization, resulting from the huge losses, both direct and indirect, occasioned by industrial accidents including personal injuries.

I do not advocate that every safety engineer avail himself of a salesmanship course, nor do I advocate that management look over its present sales staff for the most likely candidate to "sell" the organizational program. But I do advocate that every one of our particular breed of engineer—be it safety, accident prevention, loss control, or what have you—make a concerted effort to enthusiastically apply ourselves to the task of selling this intangible product called safety.

Upon reading through the volumes of material available today concerning all phases of accident prevention programs — how to start one, how to keep one alive, how to sell one to management, and others—I discover one basic underlying fact: that each author is genuinely enthusiastic about his product. *(—To page 136)*

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FOR STYLE

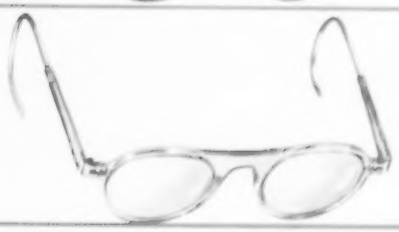
LOOK TO

WILLSON

For the best
Eye Protection

FOR UTILITY

STYLE WK Pleasing design incorporates "keyhole" bridge and HiLine® are temples in sturdy, combustion-resistant flesh color acetate butyrate. Style WKS with sideshields. Style WKP features adjustable rocker nose pads, WKPS has nose pads and sideshields.

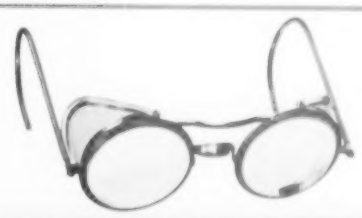


STYLE WP Saddle ridge provides maximum strength and rigidity. Sturdy, combustion-resistant frames, of flesh color acetate butyrate. Style WPS features matching sideshields. Has on-line temples—standard with ½ plastic—½ cable but also available with spade temples and elastic headband.

STYLE AV Modern frame with Hi-Line® temples permits unobstructed vision. Metal reinforcing bar adds strength and rigidity. Adjustable plastic rocker nose pads assure comfortable wearing. Sturdy, flexible covered industrial cable temples easily bend to and hold proper fit. Metal parts are of strong nickel silver, nickel plated for extra resistance to corrosion.

STYLE AH Single bridge nickel silver frame, nickel plated for added corrosion resistance, is light but very sturdy. Hi-Line® temples provide unobstructed side vision. Plastic rocker nose pads are adjustable for full comfort. Insulated cable temples adjust to exact fit for ease of wearing. Lenses are easily replaced.

STYLE B Sturdy frame with on-line temples, metal reinforcing bar, and easy lens replacement feature. Flexible cable temples covered with sweat-proof plastic. Nose bridge is rigid saddle type popular in plants without fitting facilities since saddle bridge does not require adjustment for comfortable wearing.



STYLE F350 Rugged, all-purpose safety spectacle for heavier-than-average impact hazards from all angles. Clear perforated plastic sideshields, saddle nose bridge, reinforcing bar, and covered industrial cable temples.

STYLE CPF This clip-on spectacle has light-weight, non-corrosive metal frames with the new F shape lenses. They are designed to provide protection against light impact and pitting when worn over prescription glasses.

STYLE WCS Unique hinged bridge sets WCS series apart from ordinary safety spectacles. One size for all faces . . . broad or narrow—long or short. Fits all bridge widths from 18 to 26 mm. One eye size—47 mm. Contour-Spec frames, temples and sideshields are of sturdy, combustion-resistant acetate butyrate—Style WCS47 in flesh color, WCSG47 in green. Patented Contour-Spec temples assure safe comfortable fit.

FOR STYLE LOOK TO WILLSON

The Finest Safety Spectacle You Can Buy!

With style becoming an increasingly important factor in the encouragement of safe practices among industrial workers, Willson offers a series of spectacles specifically designed for more ready acceptance. These styles feature a new lens shape which provides a wider area of both protection and vision.

They feature also sturdy attractive frames of combustion-resistant acetate butyrate sheet stock cut in a design that fosters the "Willingness to wear" that helps reduce accident costs.

STYLE WFS Flesh color butyrate frame with integrally molded strips for matching sideshields. ½ plastic — ½ cable temples.

STYLE WF Flesh color butyrate sheet stock frame. Spatula or ½ plastic—½ cable temples.

STYLE WFD Demi-amber overlay on crystal butyrate. Spatula temples only.

STYLE WFH Distinctive design of demi-amber overlay on upper portion of crystal butyrate frame. Demi-amber spatula or crystal ½ plastic—½ cable temples.

The continuing efforts of the Willson Research Center are your assurance that the quality Willson products you buy are the most modern on the market.

Today's extensive line of Willson safety equipment stems from five generations of this same intensive research and development. Each of the more than 300 products now bearing the Willson trademark reflects the quality and craftsmanship of 86 years devoted exclusively to the manufacture of safety equipment.

Over 300 Safety products carry this famous trademark

WILLSON PRODUCTS DIVISION • Ray-O-Vac Company • Reading, Pennsylvania

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Wherever you may be . . . you can get speedy local service on Willson's complete line of industrial safety equipment through these Willson Distributor Outlets.

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Baltimore, Md.—Carey Mach. & Supply Co.
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Binghamton, N. Y.—Syracuse Supply Co.
Birmingham, Ala.—Safety Engrg. & Supply Co.
Borger, Tex.—Bradley Industrial Supply Co.
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Charleston, W. Va.—Safety First Supply Co.
Chattanooga, Tenn.—C. D. Genter Co.
Chicago, Ill.—Protective Equipment, Inc.
Cincinnati, Ohio—The E. A. Kinsey Co.
Orr Safety Supply Co.
Cleveland, Ohio—Safety First Supply Co.
Columbus, Ohio—The E. A. Kinsey Co.
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Dallas, Tex.—Engineering Supply Co.
Dayton, Ohio—The E. A. Kinsey Co.
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Deadwood, S. Dak.—Hendrie & Bolthoff Co.
Denver, Colo.—Hendrie & Bolthoff Co.
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El Paso, Tex.—Mine & Smelter Supply Co.
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Hickory, N. C.—Smith-Courtney Co.
Houston, Tex.—Allied Safety Equipment Co.
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Jackson, Miss.—Dilworth of Mississippi, Inc.
Jacksonville, Fla.—Cameron & Barkley Co.
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Kansas City, Kans.—L. R. Stone Supply Co.
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Los Angeles, Calif.—E. D. Bullard Co.
Louisville, Ky.—Neill-LaVielle Supply Co., Inc.
Orr Safety Equipment Co.
Massena, N. Y.—Syracuse Supply Co.
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Milwaukee, Wis.—Protective Equipment, Inc.
Mobile, Ala.—Safety Engineering & Supply Co., Inc.
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Delta Fire and Safety, Inc.
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Omaha, Nebr.—Interstate Machinery & Supply Co.
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Pampa, Tex.—Bradley Industrial Supply Co.
Philadelphia, Pa.—Industrial Products Co.
Phoenix, Ariz.—Garrett Supply Co.
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Seattle, Wash.—J. E. Haseltine & Co.
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Call the Willson Distributor nearest you today for complete details on Willson products for industrial safety—or write directly to Willson for your free catalog of eye, respiratory and head protection equipment.

Why Buy Magic*

*TRADE MARK REGISTERED U.S. PATENT OFFICE

Ten Answers To That Question

Safety glasses make sense. But dirty glasses are a terrible hazard. One large industrial company found 68% of employees frequently injured had poor vision. Obviously, safety eyewear must be cleaned with something. And that something should be MAGIC SILICONE LENS TISSUE because:

1. It is the largest and strongest on the market. It cleans and polishes instantly without tearing. A marvel of the papermakers art. Yet it costs only $8.40 per carton of 6 big refills, and the dispenser is only $2.50, or free when exchanged for any other cleaning stations.

2. MAGIC is loaded with silicone sparkle-power. Yet it does not have the glossy surface which prevents absorbing oil and oil mists from lens. This means only one MAGIC tissue is used to clean and polish. Substantial saving.

3. Another exclusive feature: It's interfolded. Thus only one sheet at a time is removed from the dispenser. Average consumption is only six refills (one carton) per year.

4. And in grimy areas like coal mines or flour mills, where washing with a fluid is unavoidable, or anti-fogging treatment required, install the HEAVY-DUTY Cleaning Station; or in plants using plastic eyewear. MAGIC Cleaning & Anti-Fogging Fluid is combined in one can, *pressure packed*. Touch the top and Presto! the can does the rest. Scientifically regulated.

5. Each can cleans about 360 pairs of glasses, whereas old-fashioned 6 oz. bottles clean only about 100 pairs. Using MAGIC FLUID costs as little as 6 cents a month per employee. You would be amazed if you figured your old-fashioned costs.

6. It's durable: Companies now using our Fluid report it prevents fogging 6 to 8 hours.

7. If competitive liquid is being used, such liquid generally sells for about $8.45 a gallon. One carton of MAGIC cans provides about the same number of cleanings as two gallons of any liquid. MAGIC FLUID costs $12.50 per carton. A saving of $4.40 over two gallons of ordinary liquid.

8. Each packet of MAGIC HEAVY-DUTY WIPERS (not silicone-treated) contains more sheets per packet than competitive paper, yet costs less. 18 big 760 sheet refills per carton at only $11.60. Dispenser only $5.95. No scratching, no lint. Compare this cost – and buy!

9. For those wishing to make their own fluid in bulk: Our adapter to the HEAVY-DUTY Dispenser, with giant 16 oz. bottle and plunger complete, is available ($2.70). This large bottle requires as little as one refill a day. Again an important saving in maintenance.

10. Any type of dispenesr may be exchanged free for MAGIC.

MAGIC Pop-Up Pack in self dispensing box for your desk or any place in the office, plant or laboratory, $11.95 per carton of twelve Boxes.

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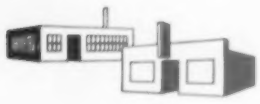

By A. M. Baltzer

Small Business Program Staff, National Safety Council

Association Meetings Make Progress in Safety Work

Activities on the East Coast and in Chicago provide more evidence that the *National Metal Trades Association* is making progress in accident prevention.

The April 26th meeting of the New York-New Jersey Branch featured the showing of our small business film, *Safety Doesn't Happen*. And in March, the Chicago Branch included a two-hour safety session in the 24-hour courses in "Fundamentals of Foremanship," attended by 400 supervisors.

Both developments should be of interest to all local safety groups and ASSE chapters because of the possibility of reaching large numbers of supervisors and executives through similar meetings.

Check your contacts with local and trade associations; urge them to include safety in their meetings, to show our film, and to make safety an integral part of training courses.

FLASH!

***Safety Doesn't Happen*, NSC film, is honored by Award of Merit of National Committee on Films for Safety.**

Major factors in the judges' decision were

- **(a) Originality of subject matter—the film *does* satisfy a need.**
- **(b) Convincing story—it makes the point that control of work accidents is an integral, necessary part of good management.**

Announce 1957 Award

Association members of the National Safety Council again are invited to apply for the Council's award for association safety activity.

Announcements and entry forms have been mailed. Association members are urged to submit their entries well in advance of the July 1 deadline to allow the Committee of Judges ample time for study of the material.

EIGHT-PAGE BROCHURE gives Milk Industry Foundation members the "why" and "how" of a safety program. Mentioned also are the MIF safety services, including its plant and fleet safety contests, co-sponsored by NSC.

Shortcut to Safety

One of our staff members, in talking to the owner of a small firm, naturally got around to asking if the company had any planned activities for preventing work injuries. The businessman didn't even seem to understand the question but finally admitted that he couldn't think of anything that they *had* to do in accident prevention.

Asked whether his employees *wanted* a safety program he replied, "Well, we're not organized and they've never *asked* for it."

First, you'll note the obvious dodge about the difference between what the employees "want" and what they "asked for." Books have been written about such weaknesses in employer-employee relations, but it is our observation that, in small firms, hazards and unsafe acts must be glaringly conspicuous before safety is "wanted." Often, there is a great deal of "wanting" before workers bother to ask—and even considerably more asking before some bosses do any granting.

Our job is to take the shortcut through this slow and uncertain process and appeal directly to the humanitarian and economic interests of the small employer; to get him thinking about planned accident prevention and then help him do something about it.

NATIONAL METAL TRADES ASSOCIATION
SAFETY AND INSURANCE SURVEY

Size Group	Reporters	No. with Rate Credits	No. with Rate Debits	With Safety AVERAGE CREDIT	Without Safety AVERAGE CREDIT
Under 100 employees	42	20 (48%)	22 (52%)	55%	33%
100 - 500 employees	57	34 (60%)	23 (40%)	60%	58%
over 500 employees	14	10 (72%)	4 (28%)	71%	0
Totals	113	64 (57%)	49 (43%)	67%	47%

NOW...you can have the NEW LOOK in ALL-METAL Safety Glasses too!

This is M-40, the newest Bausch & Lomb contribution to the safety, comfort and visual welfare of your workers. M-40 is corrosion-resistant, with all structural parts of nickel silver. You can adapt M-40 to meet many types of eye hazards by use of exclusive Bausch & Lomb Redy-Fit side shields.

New S-7 Bal-SAFE lens shape . . . for wider field of vision, better eye coverage, smarter appearance

Now there's a whole Bausch & Lomb family of PROTECTION-PLUS Safety Eyewear

Whatever your choice—all-metal, all-acetate, or combination metal-acetate—Bausch & Lomb PROTECTION-*PLUS* safety glasses bring new economies while providing better protection and greater visual efficiency. A phone call to the Bausch & Lomb supplier in your area is the quickest way to see samples, or write to: Bausch & Lomb Optical Co., 90317 Smith St., Rochester 2, New York.

BAUSCH & LOMB

HY-TEST

Safety Shoes

The Classic Medallion
H530...Brown side upper, oak leather sole, rubber heel.
H529...Same in black.

The Dressy U-Wing
H517...Black side upper, oak leather sole, rubber heel.
H507...Same in brown.

THE SAFETY SHOES WITH *Extra* ADVANTAGES

Patented features, fine craftsmanship and best materials give HY-TEST Safety Shoes advantages no others can claim. These *extra* advantages include such exclusives as the Anchor Flange ®Steel Box Toe, Bol Tan Sweat-Resistant Leather Insoles and Durisco Mildew-Proof Treated Linings. Don't settle for less... buy HY-TEST and get the best. Choose from more than 90 styles of sturdy brogans and boots to dressy oxfords.

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WIRE FROM WASHINGTON

By Harry N. Rosenfield
Washington Counsel, National Safety Council

THERE HAS BEEN no let-up of interest in Congress, or in the executive establishments, concerning safety and safety-related matters.

Industrial Safety. S. 1729, introduced by the chairman of the Senate Committee on Interstate and Foreign Commerce, and sponsored by railway labor organizations, seeks to protect railroad employees and patrons by requiring that track motorcars be operated subject to rules and regulations filed with the ICC and subject to ICC modification in the interests of safety. In the past 10 years, according to the sponsor, there have been 66 collisions involving track motorcars resulting in 92 deaths and 191 injuries.

Several Administration bills relate to motor carriers. S. 1460 would amend the Interstate Commerce Act to require the filing of brief statements by motor carriers now subject only to ICC's requirements on safety and hours of operation. And S. 1463 and H.R. 5378 would authorize medals of honor for acts of heroism involving motor vehicles subject to ICC motor carrier safety regulations.

S. 1454 would amend the Longshoremen's and Harborworkers' Compensation Act to provide a system of safety rules, regulations and safety inspection and training.

The Joint Atomic Energy Committee delved into the possibilities of accidental atomic explosions. In the course of hearings on S. 715 and H.R. 1981, which would provide for governmental indemnity for explosions in such plants, supplementary to commercial insurance, the chairman of the Atomic Energy Commission testified that the odds are 50 million to 1 against a fatality from an atomic energy plant explosion, as compared with the 5,000 to 1 chance of being killed, in any one year, in an automobile accident. He declared that atomic reactors have been in operation for more than 15 years "with a safety record better than that of other industry."

The Bureau of Mines issued additional interpretations under the Federal Coal Mine Safety Act.

A joint committee of the International Labor Organization and the World Health Organization, on Occupational Health, concluded that some knowledge of occupational medicine should be a part of the normal equipment of every physician. The committee's detailed conclusions will be submitted to the chief governing boards of the two cooperating international agencies.

Highway Safety. The House Special Traffic Safety Subcommittee (called the Roberts Committee) held hearings in Washington. The National Safety Council, the American Bar Association and the Northwestern University Traffic Institute made a joint presentation outlining the current status of basic activities and developments in the traffic safety field, with special emphasis on the need for federal support of fundamental research in traffic problems.

Maj. Gen. George C. Stewart, executive vice-president of the Council, testified that "the modern automobile is the easiest car in our history to drive safely. It is also the easiest car in our history to drive dangerously." He also urged the federal government to insist on safety design features in government vehicles in order to create public desire for such features.

From medical authority, the Committee heard justification of the American Medical Association's resolution calling for federal approval and regulation of safety standards of automobile construction, as being necessary if voluntary action failed to meet this need. One of the Committee's members asserted that the automobile industry has been "very lax" in making proven safety devices a part of standard car equipment.

The Senate Public Roads Subcommittee held hearings on proposals to promote the control of advertising along federally-aided interstate highways. Proponents of such legislation regard billboards as a hazard; opponents of the legislation argue that billboards prevent drowsiness and thus help to reduce accidents.

Two proposals are before the Congress. S. 963 would establish a national policy of barring billboards from a 500-ft. strip on either side of interstate highways, except for designated instances. The federal government would pay to the states 90 per cent of the costs of purchasing advertising rights on such 500-ft. strips, but would not require states to make such purchases.

The second proposal is the administration's, submitted by the Secretary of Commerce. It would establish a national policy of barring billboards from a 750-ft. strip except as specified. No state would be required to comply with this policy, but noncomplying states would be denied 5 per cent of their share of federal payments for interstate highways. The Secretary of Commerce testified that "uncontrolled location, erection of maintenance advertising signs . . . adjacent to the interstate

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If You Sell to Uncle Sam . . .

Your plant must measure up to the safety requirements of the Public Contracts Act

By NEWELL BROWN

WITH well over $6 billion in unclassified contracts let subject to the Walsh-Healey Public Contracts Act during fiscal 1956, this law's safety and health provisions have a vital role in maintaining safe standards in American production. They are an assurance that the Federal Government's supplies will not be procured under conditions detrimental to the physical well-being of the workers producing them. Moreover, their ramifications extend beyond the life of the contract, since safety improvements which firms make in order to comply with the law continue in effect after the contract has been filled.

Last year, the U. S. Labor Department's Wage and Hour and Public Contracts Divisions or cooperating state authorities found unsatisfactory conditions in 746 of the 1,848 plants investigated for compliance with the Act's safety and health provisions. In most cases, employers took corrective action. Management in general is recognizing that good safety and health conditions make for low costs, increased production, and high morale on the part of plant workers.

The Public Contracts Act requires that Federal Government supply contracts in excess of $10,000 be performed under adequate safety and health conditions.

Compliance with the safety, sanitary, and factory inspection laws of the state where the work is done is prima facie evidence of compliance with the statutory requirement. In some states, inspection of plants is made by state officials, through cooperative agreements between the U. S. Labor Department and state labor departments. In other states, the Divisions' investigative staff makes the safety and health inspections.

To assist industry in complying with the law's provisions, the U. S. Department of Labor has compiled various safety and health standards, largely on the basis of codes approved by the American Standards Association and safety and health codes adopted by a number of states. This compilation is contained in a booklet, *Safety and Health Standards*, which may be obtained free from the Divisions.

Safety and Health Standards: The departmental standards set safety requirements for buildings and equipment, including such categories as floors, floor openings, wall openings, elevated platforms, stairways or steps, elevators, illumination, aisles and passageways, ladders, overhead work, yards and grounds, compressed gases, oxygen cylinders, flammable liquids, explosives, and electrical equipment.

NEWELL BROWN is Administrator, Wage and Hour and Public Contracts Divisions, United States Department of Labor.

There are also requirements about fire prevention and protection; pressure vessels, including compressed air machinery and equipment; machinery guarding, and woodworking machines.

Health requirements cover such matters as medical services, environmental conditions and personal services, and special sanitation services.

These standards are in no way intended to limit or supersede state or local safety and sanitation codes. Where such codes provide stricter or more exact standards, compliance with the higher standards will be deemed compliance with the Public Contracts Act.

While the standards are designed primarily for firms working on Government contracts, they can be adapted easily to any plant or industry wanting to reduce its accident frequency rate.

Ranking among top contenders as causes of fatalities, injuries, and loss of production time are falls, falling objects, and machinery accidents. Many of these conditions occur in such a wide variety of industries that contractors in general would find it advantageous to consider how to eliminate them.

Falls. Most falls result from conditions whose hazard is plain or readily discoverable. One of the chief causes of "on the same

level" falls is slippery flooring. The departmental standards require that all floor surfaces be kept clean and dry and that they be maintained in a smooth and reasonably nonslippery condition, free from holes or projections that might cause tripping.

However, it is realized that various kinds of industrial operations necessitate working on slippery or wet floors. Where this is the case, the safety requirements will be met if the area is protected by the use of mats, grates, cleats, or other high-friction floor coverings.

Injuries caused by falls from one level to another, though sustained less frequently than "on the same level" falls, are usually more serious. One of the dangers is that persons—or materials—will fall through floor openings, wall openings, and elevated platforms. Where there is such possibility, the employer must provide standard railing and toe boards, or wood or metal covers. If guard rails are advisable, they should conform to given specifications.

Stairways or steps must be maintained in good repair, free from protruding bolts, screws and nails, and unnecessary material and dirt. They should not be slippery. Treads are to be renewed when the surface, including the nosing, shows wear to the extent of one-quarter inch or more.

Permanent aisles and passageways should be kept clear and in good repair. Where, due to lack of proper maintenance, such aisles and passageways become hazardous, they should be clearly defined by painted lines, curbings, or other markings.

Not all ladders are safely built—but the ladder that meets the specifications contained in *Safety and Health Standards* is unlikely to cause falls.

Piling of Materials. Grave and painful injuries are incurred every year by workers in the path of falling materials. The risk of such accidents is greatly reduced in plants where adequate attention is given to proper piling.

Materials, wherever stored, should be piled, stacked, or racked in a manner designed to prevent tipping, falling, collapsing, rolling, or spreading. Racks, bins, planks, sleepers, bars, strips, blocks and sheets should be used where necessary to make piles stable. Materials and objects that are stored in overhead places should be secured so that they will not fall and cause injury to workers below.

Machinery Guarding. Improperly guarded machinery causes a large number of injuries which are extremely serious, yet preventable. To single out one kind of machine for special mention, there is the abrasive wheel. Failure to guard the wheel with a hood-type guard can cause serious injury if the wheel should explode. If the tool rest is not properly adjusted, severe finger or hand injury may result. Lack of eye protection can lead to severe eye injury.

Electrical Equipment. Hazardous electrical equipment is the source of two major dangers—electric shock and fire. Loss of life and property can be greatly reduced through proper safeguards.

All wiring is to be in accordance with the *National Electrical Code*, published by the National Fire Protection Association, Boston.

This code requires, for example, that the installation of electrical equipment in workplaces where there are flammable gases or dusts must be given special attention. In such cases, lamps should be installed only in fixtures especially designed to prevent breakage and ignition of the flammable material. Equipment should be of explosion-proof design.

Lighting. Poor lighting is among the most obvious of hazards. Proper illumination can pay off by reducing the chances for accidents and by improving the efficiency of operations in general. The departmental standards require the provision and maintenance of illumination adequate to permit all work activities to be carried on safely during all work periods. Minimum standards for illumination should be in conformance with the *American Standard Practice for Industrial Lighting*, published by the American Standards Association, Inc., New York.

Fire Prevention and Equipment. There has been a steady increase in large-loss fires over the past decade and a half. Observance of departmental standards by Government contractors has helped reduce loss of life and property due to fire.

All buildings of two or more stories should be provided with

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HOW DOES YOUR PLANT RATE?

The Federal Government does not want supplies produced under unsafe and unsanitary conditions. Safety requirements of the Walsh-Healey Public Contracts Act include these categories:

ACCIDENT PREVENTION: Floors, floor openings, wall openings, elevated platforms, aisles and passageways, stairways, elevators, illumination, machine guarding, ladders, scaffolds, compressed air equipment, pressure vessels, yards and grounds, handling materials, housekeeping, accident records.

FIRE PREVENTION AND PROTECTION: Extinguishers, flammable liquids, exits, explosives, electrical equipment.

HEALTH REQUIREMENTS: Medical services, control of atmospheric contaminants, noise, sanitation services.

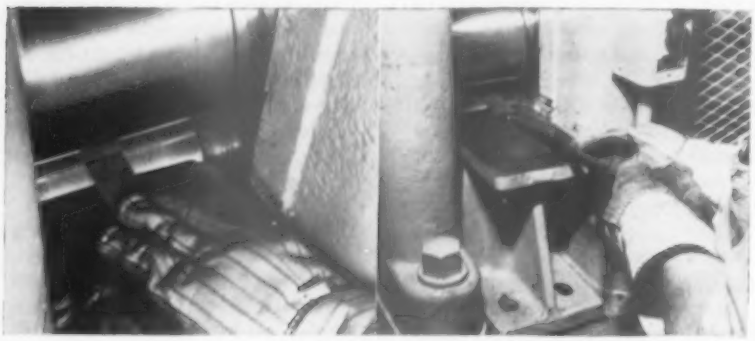
These requirements are presented concisely in *Safety and Health Standards* issued by the U. S. Department of Labor.

There's a Better Way

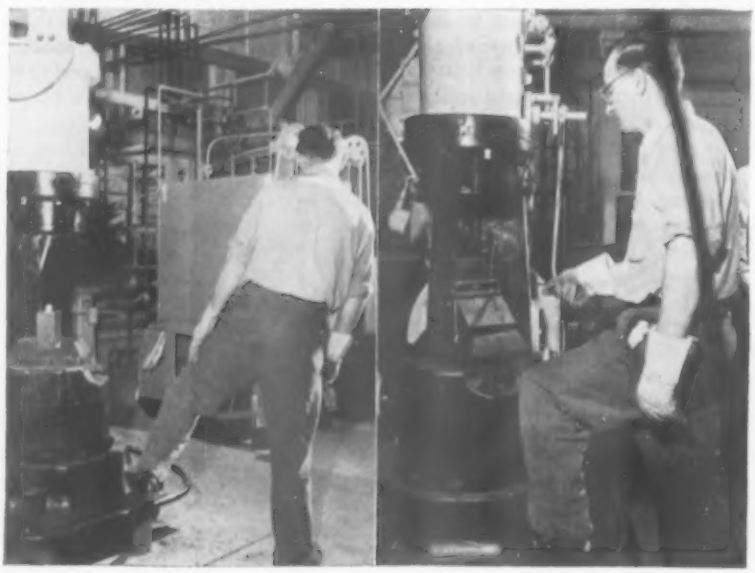
Here are seven hazardous jobs where study of operations led to new and safer methods

By THOMAS D. DOIG

FIGURES 1 and 1A. A dangerous tong grip and a safe grip.



FIGURES 2 and 2A. A dangerous rolling method and a safe method.



FIGURES 3 and 3A. Breaking up pieces of hard alloy. At the left is the old method; at the right, a much safer way.

IN THE METALS and Ceramics Building of the Research Laboratory, the nature and properties of materials being processed are often unknown. Constant alertness is therefore necessary to anticipate, recognize and correct hazardous conditions.

During the breaking-in period of a new metal processor, it is especially important to adhere strictly to correct procedures. A simple error by an inexperienced man can produce a serious accident. A few examples will illustrate what might happen.

In swaging or forging, where spinning must be expected, an improper tong grip, as shown in Figure 1, could cause serious hand or finger injury. The correct grip is shown in Figure 1A.

In rolling small pieces at the 10 x 12-in. mill, it was formerly the custom to force material into the rolls with a pair of closed tongs. Even with extreme care tongs can be drawn into the rolls. At the 6 x 6-in. rolls small pieces were sometimes forced into the rolls with gloved fingers. Figure 2 shows the dangers of this method.

Elimination of these dangerous practices was accomplished by the

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design of a finished forged rod shown in Figure 2A. On the handle is a round knob on which the processor can confidently exert pressure, knowing the rod will stop when the 4-in. long finger guide is arrested by the mill table.

On many occasions the fabrication area is called upon to break up or crush pieces of hard metal into fine particles. Often the metal was placed on the lower flat die of the Nazel hammer. See Figure 3. The operator would strike the material with a single blow, praying that shattered fragments would not come his way.

The method shown in Figure 3A affords almost 100 per cent protection. It consists of a fabricated sheet metal container built to a sliding fit of the bottom die, extending upward almost to the top of the upper die. The front top section is hinged, making it easy to position the piece to be broken, and later to observe results of the operation. A ¼-in.-thick piece of hardened steel covers the bottom die. The operator holds a similar die-sized section on top of the piece to be broken, thereby protecting top and bottom dies from defacement. This container has been used successfully to crush hard Alnico samples with a minimum of material loss.

FIGURE 5. Funnel shaped attachment is safeguard at Ceco drop hammer.

Protection of the forger poses a problem of long standing. His work demands alertness and freedom of movement often under hot and strenuous conditions. Anything heavy, cumbersome or which restricts motion must be well considered before adoption. Bullet-proof material is available to protect the upper part of the body but it is not the complete answer.

On two recent occasions while processing high temperature alloys, dangerous flying fragments were experienced. One fragment came close enough to tear the operator's pants leg. This brought about the protective measures shown in Figure 4.

The 38-in. guard at A is topped with shatterproof glass to give the hammer operator practically 100 per cent protection. The screen at B (left background) protects anyone directly behind the open forge area. The forger's assistant is holding a snap tool, C, with a funnel attachment, giving direct protection from flying fragments.

For some operations, the funnel-shaped attachment at the Ceco drop hammer has proved a protective asset. See Figure 5. Note also the screens which may be closed immediately after a forging operation when this is a danger area, because people tend to congregate to discuss results. Close proximity of a hydrogen furnace flame makes the area doubly dangerous.

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FIGURE 4. Protection from flying fragments in forging area. Guard at A is topped with shatterproof glass. Screen at B (left background) protects anyone directly behind forge area. Snap tool C gives protection from flying fragments.

ROW AFTER ROW of automatic screw machines in new plant of Fafnir Bearing Company. Continuous fluorescent lighting units maintain 40 footcandles throughout production area. Air handling units in trusses provide comfortable conditions winter and summer. Units are equipped with filters and cooling coils may be added for further air processing if conditions warrant. Power and lubricants for machines are distributed through bus ducts and piping along column lines and carried overhead to machines. Monorails transfer tubing to machines and belt conveyors carry tote boxes of semi-finished rings to automatic elevator and roller conveyor. (Photos by Austin Co.)

Fafnir Looks Ahead

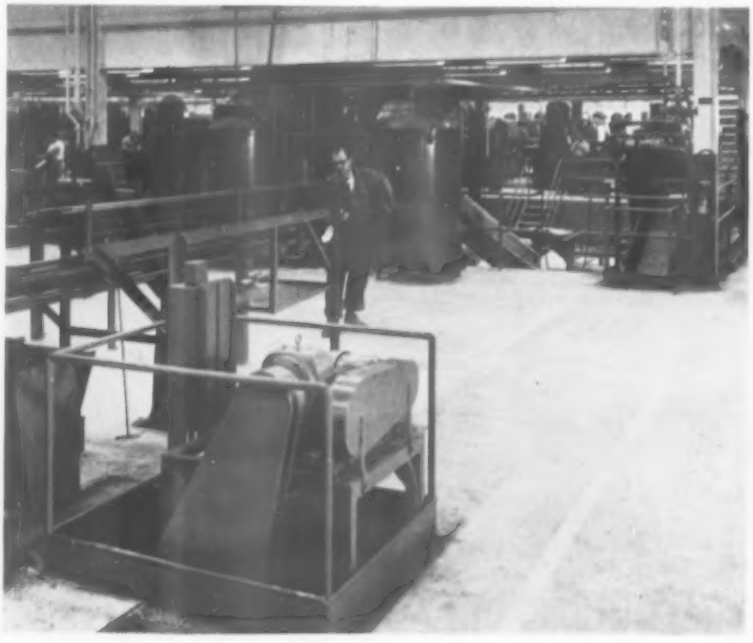
Plans made years ago result in an efficient plant with safe and healthful working conditions—and the door is open to further progress

SEVEN years ago, Fafnir Bearing Company, largest independent manufacturer of ball bearings and second largest producer in America, took an advance look at the ball bearing industry and its own prospects.

The company for many years has been located in New Britain, Conn. Its multi-storied buildings with their cut-up floor space did not lend themselves to lowest cost methods of steel handling and feeding machines, nor did they make easy the removal of chips from machine areas. Single-story construction would best solve these problems.

The multi-storied buildings necessitated several stations for preparing and distributing tooling and gauges and for timekeeping and production control. Bringing together all automatic screw machine operations in a single area on one floor would permit considerable consolidation and economy in these functions.

The long view of the industrial development and the company's prospects indicated the need for a single-story building on a site large enough to permit expansion for future growth. So Fafnir purchased a 100-acre tract of farm land near Newington, adjacent to the main line of the New Haven



HOUSEKEEPING and efficiency are aided by underfloor conveyors which remove chips from machines. These conveyors are installed in trenches alongside automatic screw machines and carry all chips to processing pit. Coolant is extracted and filtered for reuse, after which chips are blown to an overhead outdoor storage bin for pick-up by scrap buyers. This view, taken at one end of the rows of automatics, shows driving mechanism for one conveyor and checkered steel floor plate over trench.

Railroad. The Austin Company was retained to investigate the building possibilities of the site and to explore various manufacturing concepts and tentative plant layouts with Fafnir technicians.

Plans envisioned an initial single-story building of about 200,000 sq. ft., capable of multiple expansion. Ample rail and truck transportation, parking and yard services could be provided without impairing a spacious land appearance suitable for a community which was largely residential. Plans were filed away until 1955 when business expansion forced the development at Newington.

Automation's impact. In the meantime, advances in automation in the industry presented Fafnir with a crossroads problem. Should the new plant be devoted to the integrated, automated alignment of machines working on a limited variety of products? Or should it be arranged to accommodate a limited variety of machines concentrating on like operations for the whole range of products?

With industry moving in the direction of vertical integration, Fafnir's plans for the Newington plant involved consolidation and concentration. Three factors influenced the decision.

. . . *Fafnir's business is built on variety.* That means virtually no continuous runs and very few long runs. While total production of bearings is large, schedules during any period cover a tremendous variety of types and sizes. Volume on any one product or line is far from stable. Under these conditions, production continuity for complete vertical integration, in automation's current state of development, is difficult, if not impossible. Anticipated economies with automation are difficult to forecast.

. . . *A multiple-spindle automatic screw machine is in itself a perfect example of automation.* In the machine are performed in succession and without manual attention virtually all of the circular machining operations required on a ball bearing ring. Likewise, continuous heat-treating furnaces perform automatically several operations without intermediate handling.

Thus, the principle of packaged automation had already been built into these machines.

. . . *Multiple spindle automatic screw machines and continuous heat-treating furnaces carry high price tags.* Low cost production requires continuous operation. Maximum utilization of these

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SAFETY ENGINEERS APPRECIATE THESE:

- **All operations on one floor**
- **Spacious landscaped grounds in keeping with a residential community**
- **Plenty of room for expansion**
- **Parking and yard facilities**
- **40 foot-candles of light throughout the manufacturing area**
- **A ventilation system designed to permit addition of cooling coils for air conditioning**
- **Modern sanitary and personal service facilities**
- **A well-equipped dispensary**
- **Convenient facilities for receiving, storing and distributing raw materials**
- **Efficient removal of scrap**
- **Maximum accessibility of power distribution, air lines and other facilities**
- **Convenient rail and truck transportation**

. . . . . ***They're included in the new Fafnir plant***

WELL-EQUIPPED dispensary is centrally located on a mezzanine. Asphalt tile floor blends with ceramic tile wainscotting and steel partitions. Continuous fluorescent fixtures provide ample light for treatment of minor injuries.

TO AVOID traffic jams at shift changes, entrances were provided at both ends of this roomy terrazzo-paved locker room on a service mezzanine. Wash fountains and a battery of six stall showers with ceramic tile walls and terrazzo bases were installed.

Find the Office Hazards

Exhibit designed by Federal Safety Council shows many common hazards often overlooked in offices

AS PART of its general promotional activities, the Federal Safety Council has suggested that each field council set up an office hazard exhibit. Details of such an exhibit are described in the following paragraphs.

Safety in offices, it has been found, is difficult to promote. It represents an area in which employee interest is seldom high. An office hazard exhibit affords an opportunity to stimulate the interest of the office employee in common hazards and at the same time provides helpful information for the correction of these hazards.

WHAT'S WRONG here? In your own office you probably won't find all the hazards shown in this exhibit. (We hope not!) But they're all things to watch for. See diagram on facing page for key to the exhibit.

Where? The type of exhibit discussed here is particularly suited to display in building lobbies, cafeterias, and other locations where the maximum number of employees can be reached, and perhaps the general public also.

The exhibit may be staged in a public building housing a number of agencies, or it may be located in one department, depending on circumstances. Since publicity through newspapers and other media is desirable, location is a point of major importance.

Why? Development of an exhibit may pose many problems where funds and facilities are limited. To simplify the effort required for a successful project, the following information outlines some techniques that have proved effective.

Space Required. The size of floor space needed for the average exhibit should be comparable with the dimensions of an average federal office. For display purposes, the size may be increased slightly in order to allow for a maximum number of hazards to be shown but generally speaking, an area of about 15 by 20 ft. will be adequate. The accompanying floor plan of suggested arrangements is based upon a space of this size.

Equipment and Supplies. A list of furniture and other suggested items required for an average exhibit includes:

1 executive type desk and chair
1 secretarial desk and chair
3 3-drawer file cabinets
1 small table
1 worn or torn rug
1 extra straight back chair
2 wastebaskets
1 typewriter
1 adding machine
1 pencil sharpener
2 desk lamps
4 letter trays
1 glass top for desk
1 male mannequin
1 female mannequin

These items appropriately placed will provide your basic exhibit. From this point on, through imagination and ingenuity, you may add other articles particularly pertinent to local conditions.

For instance, an assortment of razor blades, sharp pencils, scissors, frayed lamp cords, soft drink bottles, paper clips, pins, thumb tacks and others should be used as props for common office hazard situations.

Establish Hazards List. As a part of over-all planning, you will need to determine at the outset, in connection with the equipment available, how many common office hazards you wish to display. Experience has shown that about 30 common hazards may be portrayed in an exhibit without making the situations too involved. These may be determined from the actual experience of participating agencies or be based on general experience and published information.

Three office hazard exhibits re-

cently set up in the Washington area included the following specific hazards:

1. Crowded or hazardous arrangement.
2. Torn rug.
3. Cracked glass on desk top.
4. Broken spring on executive chair.
5. Executive desk leaf hooked on phone cord.
6. Open bottom drawer on executive desk.
7. Overloaded top drawer file cabinet.
8. Bottom drawer left open on other file cabinet.
9. Material piled on top of file cabinet.
10. Handle missing on file drawer.
11. Lamp cord extended across floor.
12. Caster removed on secretarial chair.
13. Faulty lamp cord on secretarial desk lamp.
14. Pencils in glass with points outward.
15. Scissors on desk with point toward user.
16. Spike file on desk.
17. Razor blades in desk drawer.
18. Thumb tacks in desk drawer.
19. Soft drink bottles on floor or table.
20. Pencil sharpener sticking into passageway.
21. Cigarette on desk over full wastebasket.
22. Typewriter carriage extended out into passageway.
23. Adding machine cord—tripping hazard.
24. Adding machine leg off of table.
25. Miscellaneous material piled high on table.
26. Paper clips on bare floor.

Dramatizing the Exhibit. After the basic materials have been arranged, some window dressing is required to give the exhibit real life. Appropriately lettered show cards may be used to tell at a glance what the exhibit is all about. Special techniques should be used to direct the viewer's attention to the hazards.

One idea used in a Department of Commerce exhibit was to have flashing red lights installed at

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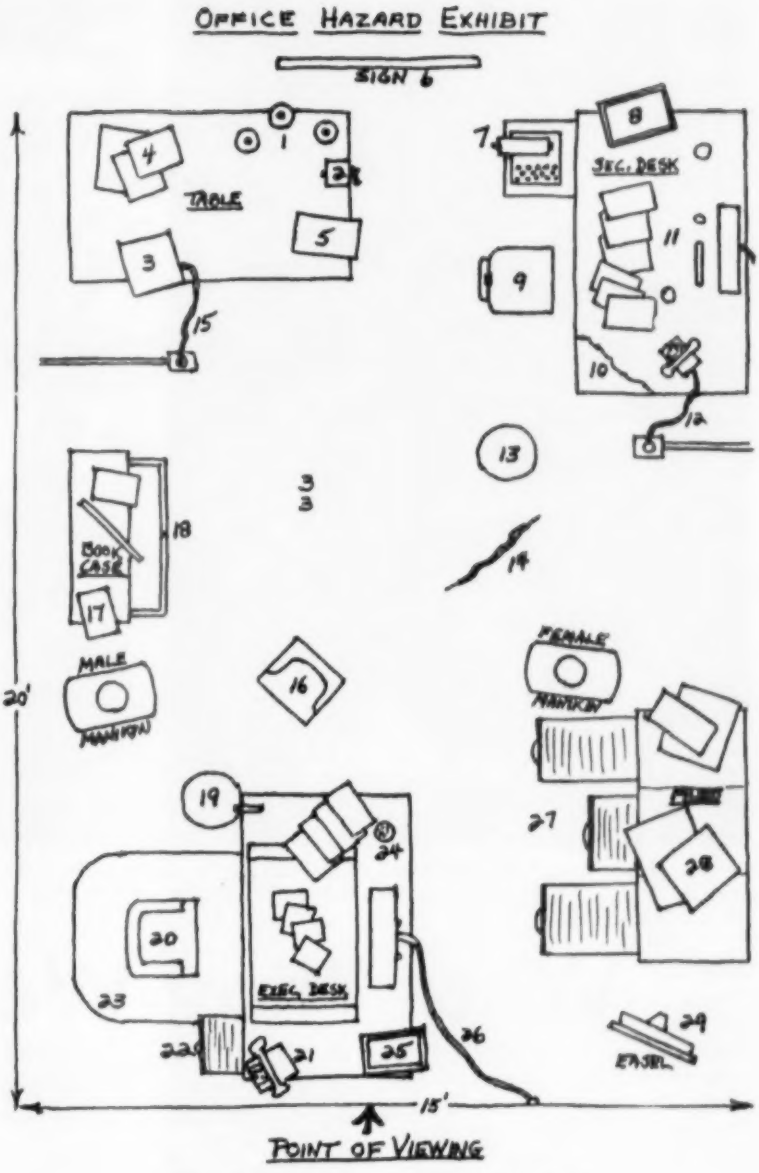

KEY TO OFFICE HAZARD EXHIBIT

1. Soft drink bottles on table.
2. Pencil sharpener.
3. Adding machine.
4. Pile of papers or other materials.
5. Box or other pertinent item.
6. Sign telling who set up the exhibit.
7. Typewriter carriage extended.
8. Box or other pertinent item.
9. Secretary chair. Caster out on floor.
10. Broken glass top on secretary desk.
11. Miscellaneous items on desk—in disorder.
12. Telephone cord in tripping area.
13. Wastebasket in walking area.
14. Tear in rug or paper clips on floor.
15. Adding machine cord tripping hazard.
16. Chair in walking area.
17. Boxes and other items piled on top of bookcase.
18. Open door on bookcase.
19. Wastebasket with cigarette or cigar on edge of desk over it.
20. Executive chair with broken spring.
21. Telephone on edge of desk.
22. Desk drawer open.
23. Worn mat.
24. Glass full of pencils points up.
25. Box or other pertinent item.
26. Lamp cord tripping hazard.
27. File drawers open, top, bottom, middle. Three-drawer files.
28. Cartons and other items piled on top of files.
29. Easel card on hazards.
30. Other hazards as pertinent to location.
31. Flashing red lights on 10 major hazards. 3x5 cards with large question mark on them at other hazard points.

LIKE THE fabled salamander, this fire-fighter at Perth Amboy Refinery of California Oil Company passes through fire unsinged—thanks to heat-resistant suit.

What They Wear Keeps Them Safe

Refining the fuel for today's motor vehicles requires prodigious temperatures, terrific pressures and powerful acids and caustics. They put protective equipment to severe tests

By MERRICK PRATT

THE BEST body protection is elimination of those chances for injury which make special clothing and cumbersome equipment necessary.

This area of safety activity is constantly being expanded, and we'll all agree that its progress is encouraging. Modern metallurgy and inspection keep the acid in the pipe, the steam in the boiler, the caustic on the inside of the valve packing most of the time. This article begins where plant equipment leaves off; or, more important, where human failure comes in. We may be approaching fool-proof equipment but it's not yet idiot-proof.

Refining is the phase of the petroleum industry I would like

MERRICK PRATT is Safety Engineer, California Oil Company, Perth Amboy, N. J. This article has been condensed from a paper presented April 17, 1956, at the 26th Annual Safety Convention of the Greater New York Safety Council.

to describe briefly, because personal protective equipment is used more extensively in this part of the oil business. To make products for today's high-octane-hungry vehicles, we heat hydrocarbons to prodigious temperatures. We squeeze these same hydrocarbons under terrific pressure. And at the same time we introduce devilish acids and caustic treatments, which means a need for employee protection commensurate with exposure.

Taking a brief look at the type equipment used to separate the employee's body from potential damage, proceed from the top down. Every man in the plant wears a safety helmet, except when he is in a car or office. He wears one summer and winter, day and night.

Universal Hat Program

There is quite a history behind this, going back some 30 years to the drilling end of the oil business. The increased use of helmets spread slowly from specific jobs—such as overhead riveting—considered hazardous, to the present universal program which includes plant visitors and contractors.

Employees of California Oil Company have a choice of a cap-type or full-brimmed hat. The safety engineer usually recommends the latter, but the cap is more popular. However, when we have a freezing rain which runs from a cap down the back of the neck, we usually convert a few more workers. A variety of colors is available, each designating a specific group. With the exception of our electricians and welders, aluminum is used. Electricians have 15,000-volt-approved plastic hats and caps; welders wear a specially designed hat of phenolic resin.

PRESCRIPTION safety spectacles are available to all employees, even those in "non-hazardous" locations.

A hat program entails a complete supply of winter liners and chin straps. We have some specialized applications, such as the combination welding hood-hard hat. This last application resulted in a request from our welders for custom-made equipment.

We make every effort to "tell the story" when a hat saves a head. Word gets around, as it did recently when one of our mailboys slipped on ice and went head over heels, landing on his helmet. We have few examples of falling objects but many of men butting into things. An example of one we missed was a senior engineer who recently came up under a filing-cabinet drawer.

Progressing down from helmets we come to protective clothing. First, we expect our employees to wear reasonable work clothes. From time to time it becomes necessary to ban a pair of beach slippers, or to insist on at least a short-sleeved shirt. Too, while Bermuda shorts may be acceptable on the floor of the New York Stock Exchange, they aren't in style for firing furnaces.

No Synthetic Undies

We haven't yet taken a stand against certain synthetics, which are less desirable, fire-protection-wise, than cotton and wool. But I understand synthetic undies aren't permitted in at least one plant because of serious burns received in a flash fire.

Personal clothing aside, each plant employee is issued a supplemental wardrobe of the following equipment: coat-and-bib-type coveralls, known as rain gear; slush boots, hard hat and spectacle type safety goggles with lenses both clear and green, with side screens.

Rain gear is our basic protective clothing. It is made of neoprene-type coated cotton and will withstand corrosive chemicals found at the Perth Amboy refinery. This gear is worn for entry into acid and caustic areas, during normal conditions for entry

EQUIPMENT used for maintenance work where chemical hazards exist. Included are: Continuous carbon monoxide alarm to monitor compressor air; manifold box with pressure reducing valve and filter; suit consisting of jacket with gloves attached, hood and trousers.

OPERATOR wearing chemical goggles and neoprene gloves in designated area during normal operations.

HARD HATS are standard equipment for all employees in the refinery area, including the plant guards.

into columns and vessels where irritating materials may be present, and for dirty jobs to protect the employee's personal clothing. (For those who are curious, we also wear this gear when it rains.)

For abnormal conditions, such as repair of an acid or caustic leak, we furnish a similar suit made of polyvinyl chloride with flame retardant over cotton. This suit consists of an air-filled hood, coat with attached gloves and the bibtype coveralls.

Another highly specialized type clothing is a heat-resisting suit used by the plant's fire department for emergencies. We don't use this gear for maintenance, since we believe that if an area is overly hot we should devise some other way of doing the work. Although we're prepared, we have yet to use these suits except for drills at our fire school, where we found that they permit work near a fair-sized petroleum fire.

1,200 F. Rain

We also have tested many types of reflecting heat suits in an effort to obtain one that would also give protection against conducted heat from contact with hot surfaces. Such a problem comes up occasionally when a leak develops in the catalyst system of our cat cracker. When this happens, small beads of silica—at about 1,200 F.—rain down and pile up like snowdrifts. Laboratory tests showed that our double-thick, glass-wool-padded suit was the best of the then-available suits. However, it is not satisfactory for this catalyst job, giving only about a minute's protection. So we're still looking for the answer.

Equipment worn by more than one man is cleaned after each use. Dirty clothing is returned to the toolroom, and from there, sent to a laundry. Other personal protective equipment not assigned to an employee (such as respirators, breathing apparatus facepieces, acid hoods) is washed by a toolroom employee with hot water and soap.

We have tried a number of patented bug-killer solutions but have experienced difficulty with either skin irritation or the equipment dissolving along with the dirt. Clean equipment is packaged in Pliofilm bags stapled closed. A man receiving the equipment in the field knows when he breaks open the bag that the facepiece he is about to put on is clean.

Before going on to other features of body protection, let's consider the administration of this clothing program. All our employees don't need all the issued equipment. About 90 per cent does. The remaining 10 per cent needs some of the equipment, but each segment of that group requires different articles.

At first, for example, we issued slush boots as needed. We found it was bothersome to a field supervisor to determine which employees had been issued what clothing; and sometimes, as a result, the job was done without proper clothing. Too, there was clothing lost during this time, and total issues amounted to more boots than we had employees.

Uniform-Issue System

This prompted the present system of issuing each man the same item. While we aren't completely satisfied, I can say that for us the uniform-issue system is best. Personal protective equipment is charged out to each man the same as tools are. If equipment wears out or breaks, it can be replaced by turning in the old article. Lost personal protective equipment is handled in the same manner as lost tools, and can result in disciplinary action.

Periodically, we receive requests from employees for additional company-furnished clothing. While requests are made for safety's sake, investigation shows that it is almost always an effort

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LOCKED SAFE

The machine can't be started until all padlocks and tags are removed by the men who put them there

SAFETY ORDER NO. 1—the first general safety order issued many years ago by Armco Steel Corporation—gave procedures to be followed in inspection and repair of electrically driven equipment. It provided that before beginning inspection or repairs, safety disconnect switches for the unit must be properly opened, tagged and locked out. The procedure is:

1. The man who first pulls the switch lever at the motor must do so with his left hand. This keeps his face and body away from the front of the switch door.

2. Switch box cover is opened for inspection to make sure switch blades are fully disengaged.

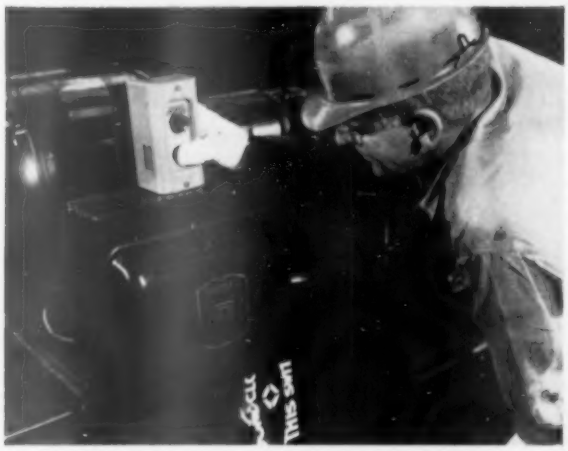
3. The starting button is tried to be sure power supply is completely cut off.

4. Switch box cover is closed, switch is tagged with a "Don't Close This Switch" tag, and locked with a padlock. Only one man—and he is responsible—has the key that fits the padlock.

5. All the above checks are made before any work is done. If other men work on the same unit, they too must follow the same procedure and tag and lock out the switch box. Only the man who originally locked out the switch may remove the lock and tag.

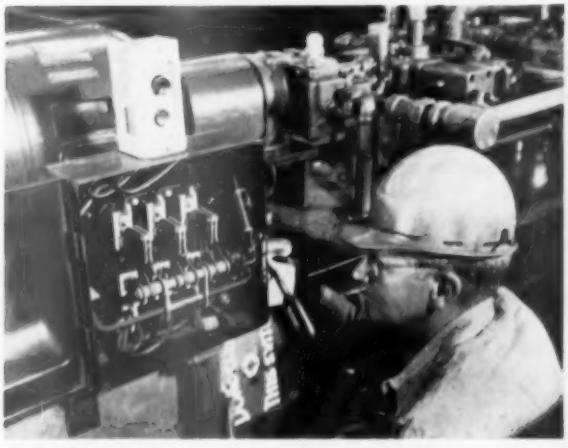
This procedure has become more or less standard throughout industry. But like many another rule with obvious benefits, it requires constant training and supervision to insure compliance.

The accompanying photos were posed by Armco men at Middletown Works and are made available through courtesy of *The Arm-co-operator*.



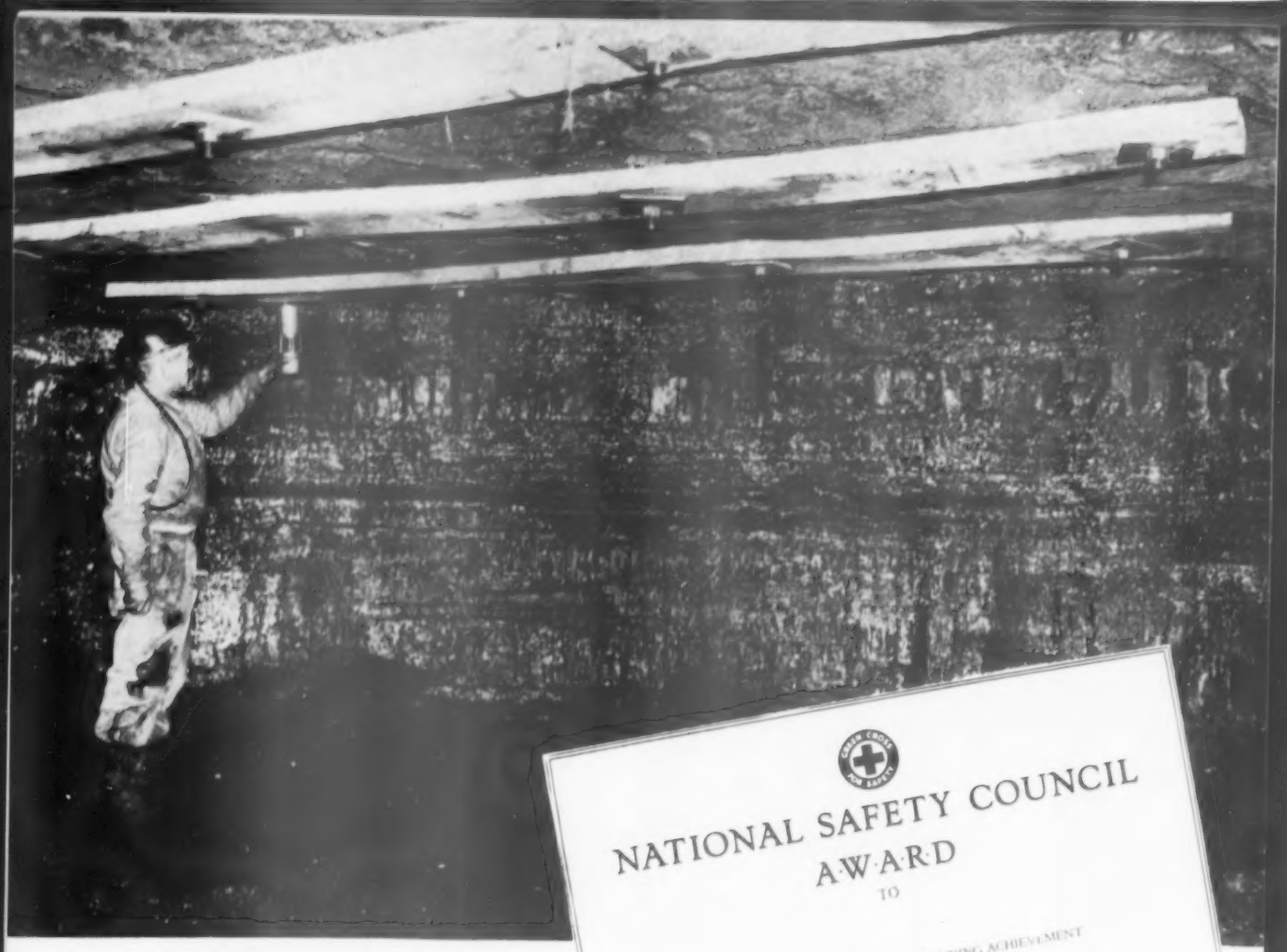
1. **BEFORE** beginning work on any electrical equipment, the contact button is punched to stop the machine.

2. **USING LEFT HAND** (so his body is safely off to one side) power disconnect switch is safely opened.



3. **SWITCH OPEN**, the switch door is opened to make sure none of the electrical contacts are touching.

4. **FREQUENTLY** several gangs work on the same equipment. Each gang tags and locks out switch.


NATIONAL SAFETY COUNCIL
AWARD
TO
IN RECOGNITION OF ITS OUTSTANDING ACHIEVEMENT
IN PREVENTING INJURIES FROM ROOF FALLS
NATIONAL CAMPAIGN FOR THE PREVENTION OF INJURIES FROM FALLS OF ROOF
JULY 1, 1957—JUNE 30, 1958

FACE ROOM showing roof bolting at a coal mine in West Virginia. (Photo by U. S. Bureau of Mines)

Launch Drive on

Coal Mines' Enemy No. 1

PLANS for a year-long campaign aimed at slashing the death and injury toll from roof falls in coal mines — the No. 1 death-dealer to coal miners—have been announced by a campaign steering committee representing all segments of the industry.

Goal of the national campaign, which begins July 1 and continues until June 30, 1958, is a 50 per cent reduction in roof-fall injuries and fatalities.

The campaign is sponsored jointly by the American Mining Congress, Bituminous Coal Operators Association, the Coal Mining Section of the National Safety Council, the Mine Inspector's Institute of America, National Coal Association, Southern Coal Producers Association, United Mine Workers of America, U. S. Bureau of Mines, state and provincial mining departments, and coal mining publications.

The sponsoring organizations want no repetition of the 244 deaths and about 5,000 disabling injuries from roof falls that occurred in U. S. coal mines last year—worst mark in recent years.

They fear that this large toll of injured and killed will continue unless more aggressive measures are taken to prevent such accidents.

Any underground coal mine in the United States, Canada or else-

where is eligible for the campaign. Companies operating two or more mines will enroll each separately.

Entrants will provide a simple report of injuries resulting from falls of roof, rib and face for one, two or three years previous to July 1, 1957, depending on the period for which records are available. Participants will provide a report at the end of the first six months of the campaign and a similar report covering the campaign's final half.

To help participants carry on a continuous and effective campaign during the year, the National Safety Council will make available various materials:

—Two-color announcement posters for informing employees of the campaign.

—Two-color special posters (a series of 12, one for each month of the campaign) emphasizing ways to avoid injury from roof falls.

—Scoreboard posters showing a monthly comparison of injuries from roof falls for the campaign year with the corresponding month of the previous year.

—Twelve information sheets covering such subjects as how to detect loose roof, the importance of observing standard roof bolting or timbering plans, facts about falls of roof, etc.

—Illustrated booklets (a series of four) emphasizing safe practices pertaining to the prevention of falls of roof.

Suggestions on conducting an effective campaign will be provided participants on enrollment together with sample posters, etc.

The National Safety Council will award the following certificates to mines, supervisors and union locals that meet the campaign goal and other requirements:

1. Certificate of Achievement. To win this a mine must have conducted during the campaign year a minimum of six safety activities aimed at the prevention of roof falls. And it must have achieved either (1) a 50 per cent reduction in the frequency of in-

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IF THE TOP tests loose, support it or take it down. (Photo by U. S. Bureau of Mines)

ONE OF SERIES of 12 major safe-practices posters available from National Safety Council to promote roof falls campaign.

Teamwork and safe work practices, taught during indoctrination and stressed throughout employment, make a world record possible

ADMIRING what they see on the safety barometer are Fred G. Gronemeyer, plant manager, Glenn Frank and Kathy Brooks, members of the central safety committee, and Lou Dequine, assistant manager. It indicates a new world's textile safety record for Chemstrand's Pensacola plant.

A WAY OF LIFE AT CHEMSTRAND

SORRY, SIR. You'll have to move back behind the red line or put on safety glasses."

The visitor at Chemstrand Corporation's huge nylon plant at Pensacola grinned and stepped back.

The employee didn't know he was warning the then president of the company who had come down from Decatur, Ala., to inspect the new plant. But he would probably have done the same if he had known.

For safe operating practices form very much a way of life at the sprawling nylon plant where nearly 5000 employees celebrated a new world's safety record for the textile industry on March 27.

Plant employees passed the previous record of 13,624,000 manhours without a disabling injury on March 12. By the time the official celebration was held, score boards at plant check-in points showed more than 14,000,000 safe man-hours.

When the last disabling injury occurred—on August 24, 1955—the boards showed a warning red for 24 hours. Since then they have glowed a happy green.

Now the goal of Chemstrand people is to beat the all-industry record of 28,743,768 man-hours established by Du Pont's Old Hickory plant.

The last disabling injury in the plant occurred when an employee slipped and fell on a freshly-scrubbed floor in the cafeteria.

In recognition of Pensacola's record, the National Safety Council's "Award of Honor" was presented at the March 27 ceremonies by Roy G. Benson, assistant director of the Council's Industrial Department. He also presented the plaque won by the plant for the lowest frequency rate in Division II, Group A in Council's Textile Section during 1956.

The State of Florida also recognized the record with a special honor award presented by J. T. Vocelle, chairman of the Florida Industrial Commission, in behalf of Governor LeRoy Collins.

"We are together celebrating a great accomplishment by you people—a world's record in safe working," Chemstrand President Edward A. O'Neal, Jr., told the gathering. "There are all sorts of world records these days, mostly accomplished by individuals. Your record is one of teamwork for the good of the whole."

That team concept is conspicuous in all Chemstrand's opera-

tions. Talk to people throughout the plant and you can feel their pride in being part of a fast-growing company.

When Pensacola produced its first nylon in December 1953, the completely integrated plant was designed to produce 50 million pounds a year. Today it is being expanded to produce 114 million.

At Pensacola they'll tell you, "We make the world's best nylon." And the team pride carries over into safety. It's something you can feel.

But management doesn't depend on team pride alone; there's a continuing emphasis on safe operating practices.

Indoctrination and training. Safety emphasis begins with the new employees' orientation sequence which comes before he or she (more than half the employees are women) starts actual work.

For many of them it is their first industrial employment, but that has not proved to be a handicap. They learn readily and have few unsafe work habits to unlearn.

In training, the "Four E's" of safety are explained—Engineering, Education, Enthusiasm and Enforcement. In this presentation and throughout the entire safety program the emphasis is on the first three. Certainly, disciplinary power is available if needed but the positive side is stressed.

The safety organization and program was no last-minute affair. It has clearly benefited from extensive planning before actual plant operations began.

Three full-time safety men, with competent secretarial help, are responsible for the program under the general supervision of Superintendent Emerson R. Boner, whose duties include safety, fire and plant protection, general offices, and plant cafeteria.

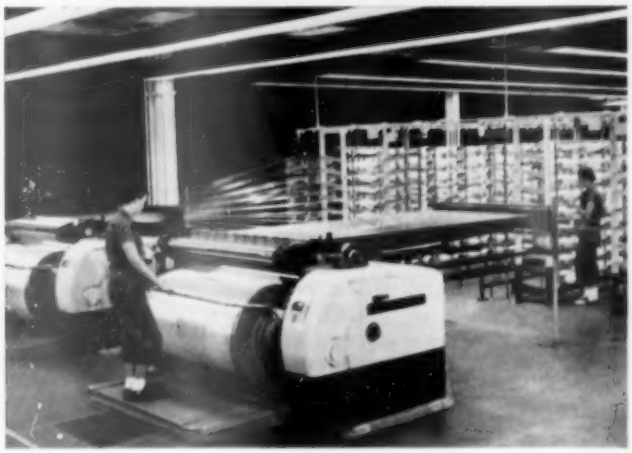
A graduate of Cumberland University where he earned a B. S. degree in chemistry, he has had wide experience in both chemical plant operation and in accident prevention. He is a member of American Chemical Society and the American Society of Safety Engineers. Currently he is a member of the board of directors of the Southern Safety Conference, Pensacola Chamber of Commerce Highway Safety Committee and the Escambia County Disaster Committee (Red Cross).

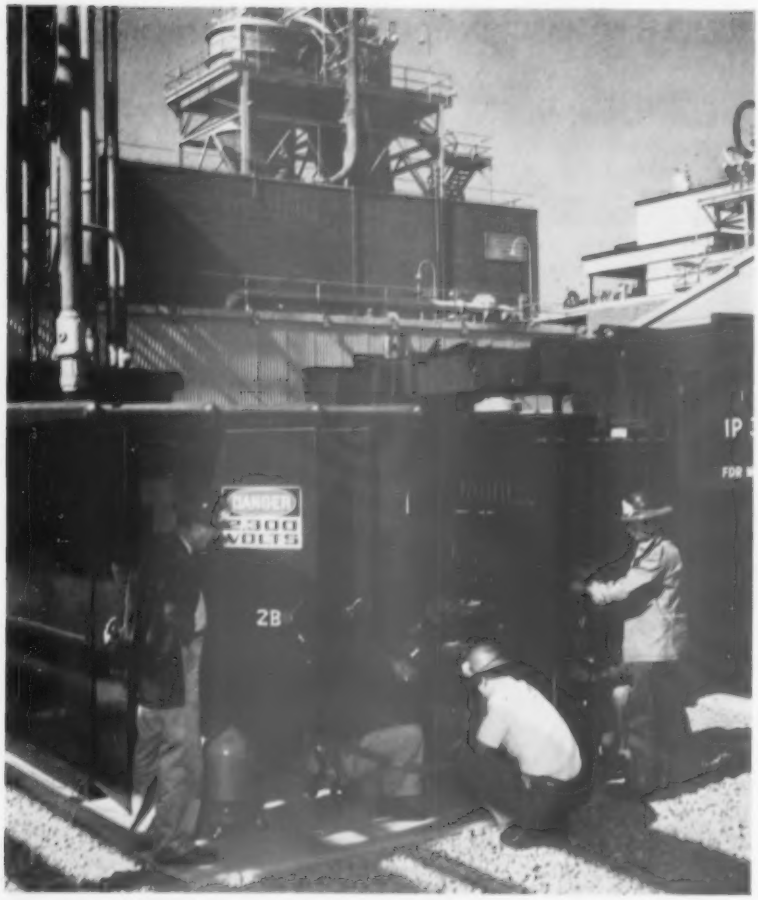
Guy Booker, safety supervisor, is aided by two safety engineers, Joe O. Fisher and Dabney T. Hardy.

Mr. Booker joined Chemstrand in 1952 after five years as safety engineer with Monsanto Chemical's Plastics Division at Springfield, Mass. During World War II he was safety officer at the Brooklyn Navy Yard and before that he was safety engineer with a leading casualty insurance company. He received his B. S. degree in mechanical engineering from the University of Maine. Professional memberships include American Society of Safety Engineers, executive committee of the Textile Section, NSC. He is a member of the planning com-

PLASTIC record boards like this one are located at major entrances to the plant. The plant has been green-lighted since the last disabling injury—more than 14 million man-hours before this picture was taken. Should a disabling injury occur, the board would show a red light for 24 hours.

WELL-LIGHTED, spotlessly clean work areas, like this room where nylon tire cord is being put on beams, are found throughout the enclosed areas of the plant. More than half the employees are women.





MAINTENANCE of equipment and use of personal protective equipment are accepted practice. This substation is part of the extensive electrical facilities.

men is the Central Safety Committee composed of both supervisory and nonsupervisory employees. This committee meets regularly to discuss working practices and conditions and make recommendations for improvement. Membership is rotated so that an increasing number of employees may become familiar with the work of the committee and contribute their knowledge to accident prevention.

At safety meetings, held at least once a month in every area of the plant, an area supervisor presides. Memories of those in the area are refreshed on safe operating practices and supervisors encourage discussion and suggestions by employees.

While the safety men are available for professional guidance, they avoid the limelight at meetings.

A careful and continuous inspection system to search out and correct hazards is a joint responsibility of the safety men and supervisors.

When an accident does occur, a careful investigation and analysis is made to determine the basic cause and precautions for preventing a recurrence.

PICTURED after the presentation are, left to right: Guy Booker, safety supervisor; J. T. Vocelle, chairman, Florida Industrial Commission; Edward A. O'Neal, Jr., Chemstrand president; Roy G. Benson, NSC; Fred G. Gronemeyer, plant manager; Emerson R. Boner, plant service superintendent; George Horst, director of personnel, American Viscose Corp.; Roy G. Hemminghaus, vice-president, manufacture; John L. Christian, vice-president and general manager, Inorganic Division, Monsanto Chemical Company; Lou Dequine, assistant plant manager.

mittee of the Northwest Florida Safety Council.

Joe O. Fisher was graduated in industrial education from Louisiana State University and before joining Chemstrand in 1953 had experience in industrial training with the Texas Eastern Transmission Corporation.

Dabney T. Hardy received his degree in textile engineering from Alabama Polytechnic Institute. Before joining Chemstrand in 1956 he had eight years' experience in textile production with Pepperell Manufacturing Company at Lindale, Ga.

Working closely with the safety

Medical service. Even minor first-aid cases are unbelievably few but plant policy insists that even the most trifling injury be reported and treated in the well-equipped medical facilities. Service is available around the clock. A trained nurse is on hand at all

—To page 190

RESCUE BEGINS. By means of landmarks on opposite shore, skin divers mark area where victim went under.

UNDERWATER SEARCH begins. Swimming along lake bottom, diver holds floodlight with left hand and extension cord with right.

Underwater Lifeguards

New role for skin divers

LOCATING and recovering a drowning victim is often a difficult and perilous phase of the rescue operation. Wind velocity, depth and temperature of water, or hidden underwater obstructions or currents can hamper or even cause failure of the best rescue efforts.

Skin diving, when utilized as an underwater rescue technique, minimizes the danger period. Equipped with mask, air supply, rubber suit, depth gauge and water-tight floodlight, a competent skin diver can pit his swimming skill against the water that holds the drowning victim.

By means of landmarks on the opposite shore, skin divers mark the general area where the victim went under. Once the spot is reached, two divers start downward toward the bottom of the lake. With the aid of an underwater floodlight, the victim is located and brought to the surface.

A mechanical resuscitator is part of this crew's equipment. If apparatus is not immediately available, manual resuscitation should be started without delay.

This simulated rescue was photographed at Green Lakes State Park, Syracuse, N. Y. It shows a group of leisure-hour submariners, the Aqua Kings, demonstrating the use of skin diving in life saving.

FINAL PHASE. Unconscious victim is placed face down while artificial respiration is applied by means of mechanical resuscitator. If apparatus is not on hand, manual resuscitation should be applied without delay.

SKIN-DIVING GEAR. Diver wears rubber suit encircled by weight belt that has quick release catch workable with one hand. Mobile generator furnishes electric power (115-120 volt a.c.) for Crouse-Hinds type DIV underwater floodlight. Resuscitator is MSA Pneolator. Manila and nylon rope and extra air lungs are needed.

REMOTE-CONTROLLED trailer and tongs used by members of the Health Physics Division, Idaho Operations Office, AEC, in handling radioactive materials. Tongs are supported by portable tripod. Jaws, knives or hooks can be placed at the end to perform operations necessary in handling radioactive materials.

Getting Rid of

RADIOACTIVE WASTES

By JOSEPH A. LIEBERMAN

Widespread peaceful application of nuclear technology will depend to a considerable degree on finding practical methods of waste disposal

WASTE MATERIALS in gaseous, liquid, or solid form are evolved in essentially all operations associated with nuclear energy facilities. They begin with the mining of ore, through feed material production, reactor operation, and chemical reprocessing of reactor fuels. Characteristics of the radioactivity involved include very long effective life, ability to damage human tissue, and potential danger as an environmental contaminant. Therefore, safe handling and final disposal of wastes from the nuclear energy industry are integral aspects of these operations.

It has been said that the widespread peaceful and beneficial application of nuclear technology will depend to a considerable degree on our ability to find practical solutions to problems of waste handling and disposal. While it reasonably can be argued that no industry can be considered a mature segment of our economy until it disposes of its wastes in an acceptable manner, there is sufficient basis for the belief that the nuclear energy industry can develop in a rational way without being "bottlenecked" by its wastes.

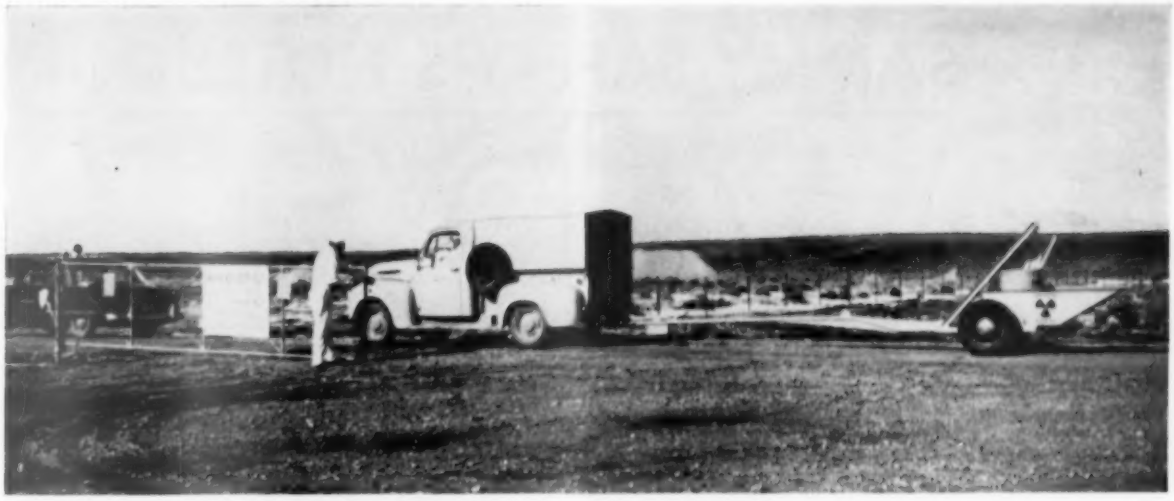
This conviction should not, however, imply that specific answers are immediately available. Much research, development, pilot-plant testing and field evaluation have yet to be done before firm engineering conclusions will be possible for all situations.

One of the major objectives of our engineering in this field is control over the radiation hazard from these wastes. Obviously, this involves control over the movement or mobility in the environment of the waste products themselves. This introduces the two basic waste disposal concepts.

Radioactive materials may be permanently confined or isolated within restricted areas. This is the concept of "concentrate and contain."

On the other hand, radioactivity may be irreversibly reduced to safe levels by dilution in nature. This is the concept of "dilute and disperse."

JOSEPH A. LIEBERMAN is Sanitary Engineer, Engineering Development Branch, Division of Reactor Development, U. S. Atomic Energy Commission, Washington, D. C. This article has been condensed from an address before the Engineering and Sanitation, Laboratory, and Occupational Health Sections, American Public Health Association, Atlantic City, N. J., November 16, 1956.



HEALTH PHYSICIST at Idaho Operations Office opens gate to let security patrol car and truck hauling cartload of high level radioactive waste into burial ground at Atomic Energy Commission's National Reactor Testing Station. Patrol cars accompany movements of radioactive materials as a precaution against accidents.

For example, with suitable environmental conditions certain types of laboratory liquid wastes in which the concentration of radioactivity is only a few times greater than drinking water standards may be disposed of under the latter concept. At the other end of the spectrum, highly active liquid wastes originating from the chemical processing of irradiated fuels must be handled under the former method.

For all practical purposes, waste materials from the chemical processing of irradiated fuels contain by far the greatest concentrations and total quantities of radioactivity. They constitute the bulk of the long-term technological problem of waste disposal.

The fact that wastes containing smaller quantities of radioactivity may be amenable to direct dispersal in the environment, however, makes it important to control such operations so that the safe capacity of the environment is not exceeded.

Characteristics of Wastes

Gaseous wastes. Characteristics of gaseous and/or air-borne particulate wastes vary widely, depending on the nature of the operation.[1] In gaseous form they may range from rare gases, difficult to remove, such as argon from air-cooled reactors, to highly corrosive gases, such as hydrogen fluoride from chemical and metallurgical processes.

Particulate materials (aerosols) may be organic or inorganic. They may range in size from less than 0.05 microns to 20 microns. The smaller particles originate from cleaning requirements for many nuclear energy operations results from the extremely small permissible concentrations of various nuclides in the atmosphere. Often removal efficiencies of the order of 99.9 per cent or greater for particles less than 1 micron in diameter are necessary. These criteria are much more stringent than heretofore encountered in industrial hygiene engineering, and in the early days of the industry metallurgical fumes caused by oxidation or vaporization. The larger particles may be acid mist droplets of low specific gravity which may remain suspended in air or gas streams for longer periods. *(—To page 141)*

ATOMIC WASTE, packed for disposal in concrete-lined double-wall steel drums, is handled by laboratory-equipped fork truck with revolving barrel-grab attachment. Mechanized handling reduces radiation hazards.

SAMMY SAFETY'S NOTEBOOK

By Arthur S. Kelly

Industrial Department, NSC

Got a Safety Idea? Choose Your Prize!

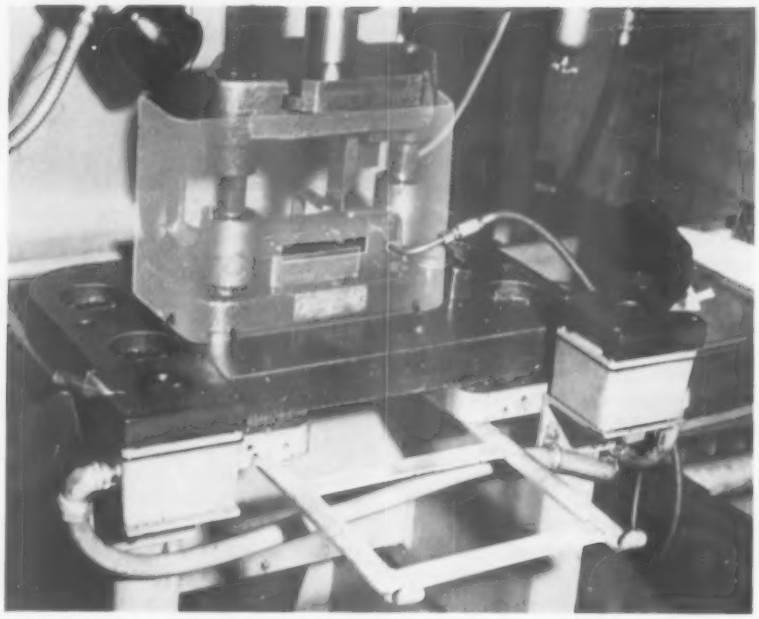
The specified merchandise prizes previously offered for winning ideas submitted to Sammy Safety's Notebook have not always been in stock, resulting in some inconvenience to our winners and a bit of embarrassment to ourselves. We have a new plan that we are sure will work better.

Each monthly winner may select his choice of any item, or combination of items, listed in the Council's Incentive Catalog up to a total list price of approximately $15 (we won't quarrel about odd cents under a dollar). Or, the monthly winner may select a personalized copy of the *Accident Prevention Manual for Industrial Operations* with his name imprinted in gold on the cover.

The semi-annual winner (for the best of the winning ideas of the preceding six months) may select his choice of any item or items from the Incentive Catalog totaling approximately $25 list.

We hope this new award plan will find greater favor with our readers. So send in your idea. Whether or not it wins an award, it may help someone else prevent an accident.

The winner for April was Cecil Bender, production expediter for International Harvester Co., Canton, Ill., who submitted the mirror gadget for determining the contents of tote boxes stacked above eye level.



Two-hand Press Controls

To prevent the operator from "bridging" the two button controls indicated by the arrows, blocks were installed as shown. Now the operator is forced to use both hands to trip this press.

Submitted by S. J. Curtis, Burroughs Corp., Detroit, Mich.

Railroad Car Chock

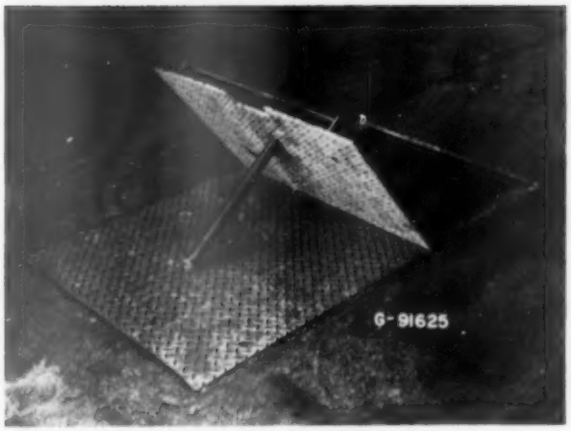
This homemade railroad car chock gives full protection to the hands. It is made of 11 pieces of 5-ply belting with a 4-ft., 7-in. handle of 1-in. pipe set at a 15° angle for easy handling.

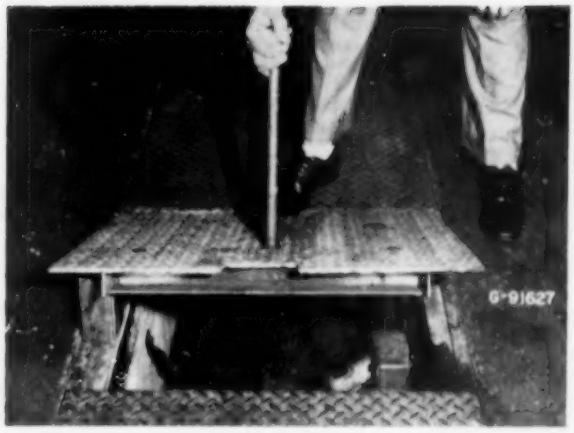
The bottom piece of belting is 1 ft., 5 in. long and the top piece is 7½ in. long. Intervening pieces vary in length, successively, by 1 in.

Four 5-in. carriage bolts, 5/16 in. in diameter, hold the pieces of belting together. The bolts are set 5 in. apart and 6 in. from each end. From side to side the bolts are 2½ in. apart.

The plate which is inserted between the fourth and fifth (from the top) piece of belting is 10 or 12 gauge plate welded to the handle. The plate is 8½ in. long and the width corresponds to the width of the belting.

This idea was developed in the Kansas City plant of the Ralston Purina Co., St. Louis, Mo.





Trench Cover Lifter

As airplanes get larger and heavier, hangar trench covers must be beefed up as well, and as a result become more difficult and hazardous to lift. Grumman Aircraft hit on the idea shown here.

The cover, made of ½-in. diamond plate, weighs 175 lbs. and fits free; it is not hinged. Formerly, it was lifted by inserting fingers in the slot and lifting one end.

The solution is a 20-in. length of 1-in. diameter pipe which drops down into the trench when not in use. The pipe slides freely through a bushing or boss made of a 3-in. length of 3-in. diameter pipe. The hole in this boss is 1⅜ in. in diameter.

To keep the pipe in reach, a ring made of ¼-in. rod is brazed around each end. The pipe end is prevented from protruding above the cover by drilling a 2¼-in. diameter hole ¼ in. deep in the cover so the end of the pipe rests flush with the cover.

Submitted by Burt J. Wilke, Grumman Aircraft Engineering Corp., Bethpage, L. I., N. Y.

Approve Standard for Pulp and Paper Mills

"Doors of pocket grinders shall be so arranged as to keep them from closing accidentally." This is one of the 225 requirements of a new American Standard for the safe operation of pulp and paper mills.

The document, Pl.1-1956, *American Safety Standard for Pulp and Paper Mills*, outlines measures to protect employees and property for the trek of wood from freight car to finished pulp or paper.

Protection for workers includes safety regulations for guards, protective clothing, floors and platforms, lockouts and power trucks. Whenever possible, the code says, all dust, fumes and gases incident to handling materials shall be controlled at the source. Where not possible, respirators shall be provided for workers handling alum, clay, soda ash, lime, bleach powder, sulfur, caustic soda, chlorine and similar materials. When handling liquid acid or alkali, workmen must be given approved eye and face protection, rubber gloves and protective equipment.

And knocking down wood from the woodpile must be done by special mechanical equipment —not by hand—says a section of the American Standard. And only authorized men shall be allowed to dynamite the woodpile.

A safe guillotine? If made and used according to the safety standard's three provisions, there is no danger from the guillotine type cutter:

1. Each guillotine-type cutter shall be equipped with a control which requires the operator and his helper, if any, to use both hands.
2. Each cutter shall be equipped with a nonrepeat device.
3. Carriers shall be provided for transportation of knives.

Several chapters of the code are devoted to the preparation of pulp wood, including the saws, hand and machine barking, splitters and chippers. In the beater room section, safety requirements cover beaters and washers and the newer type machines.

The committee which wrote the code was composed of representatives of the pulp and paper industry, trade associations, labor unions, insurance companies, manufacturers of pulp and paper mill machinery and equipment and government units.

In addition to the general committee, several subcommittees were formed. The general committee held several sessions in New York. Assistance was given by the Executive Committee of the Pulp and Paper Section of the National Safety Council. The Section considered the new code at the National Safety Council's 1956 Congress in Chicago and expressed "great satisfaction with the accomplishment of the committee."

Copies of the code are available from the American Standards Association, 70 E. 45th St., New York 17, at $1.00 a copy.

The shapely gal had the dress back on for the third time and was strutting before the mirrors when the saleslady asked: "Would you like to go out on the street and try it for whistles?"

SOURCES OF INFORMATION ON NUCLEAR ENERGY

Published by National Safety Council
425 North Michigan Avenue, Chicago 11

Introduction

1. The problems of nuclear energy are no longer confined to the laboratory, and many safety engineers are now being called upon to specify precautions and institute safety measures respecting radioactive substances.

2. Accordingly, the Nuclear Energy Committee of the National Safety Council's Industrial Conference undertook the preparation of a bibliography to encourage more extensive and uniform use of the available information in this field, and to promote more effective control of atomic energy accidents by industrial safety engineering.

3. Realizing that to understand the problem of radiation and fire hazards in this area it is necessary to have a fundamental understanding of atomic energy, the committee included some accepted and basic texts as introductory information on the problem.

This Data Sheet is one of a series published by the National Safety Council, reflecting experience from many sources. Not every acceptable procedure is necessarily included. Data Sheets should not be confused with American Standard Safety Codes, federal laws, insurance requirements, state laws, rules and regulations, or municipal ordinances.

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3. *Power Reactors*
4. *Cross Sections Important to Reactor Design*
5. *The Physics of Reactor Design*
6. *Geology of Uranium and Thorium*
7. *Nuclear Chemistry and the Effects of Irradiation*
8. *Production Technology of the Materials Used for Nuclear Energy*
9. *Reactor Technology and Chemical Processing*
10. *Radioactive Isotopes and Nuclear Radiations in Medicine*
11. *Biological Effects of Radiation*
12. *Radioactive Isotopes and Ionizing Radiations in Agriculture, Physiology and Biochemistry*
13. *Legal, Administrative, Health and Safety Aspects of Large-Scale Use of Nuclear Energy*
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52. *Maximum Permissible Amount of*

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ACKNOWLEDGMENT

This data sheet was prepared by the Nuclear Energy Committee of the Industrial Conference of the National Safety Council. It has been approved for publication by the Publications Committee of the Industrial Conference of the National Safety Council.

Report Increase in Barbiturate Deaths

DEATHS FROM barbiturate poisoning in the United States are on the increase, the Metropolitan Life Insurance Company's statisticians report. In 1955, the latest for which complete data are available, accidental poisoning by barbiturates claimed 411 lives, as compared with 345 in 1954, 337 in 1953, and 327 in 1952. This reverses the trend for the years immediately preceding.

About 30 per cent of all deaths from accidental poisoning by solids and liquids during 1955 were caused by barbiturates; this compares with nearly 25 per cent for all other drugs and medicines. The remainder of the fatalities were caused by a variety of substances, including such poisons as wood and denatured alcohol, lead compounds, carbon tetrachloride, benzene, kerosene, the alkalies, and insecticides.

Much can be accomplished in reducing the loss of life, the statisticians point out, by keeping drugs and medicines in properly marked containers, by storing insecticides and disinfectants away from food and other edibles, and by keeping poisonous substances out of the reach of young children.

Easy on the and

The most popular men's pattern of today is now available in brown and black

No. 627
(as illustrated)

No. 628
(dress black)

Iron Age

The Safety Shoe for Industrial America

The Iron Age "Low-Lo"
STEEL TOE
Safety Oxford

Iron Age proudly presents a trim, new three eyelet oxford, smartly molded in tan, soft grain leather. You can't mistake the fashionable low contour styling that's all the rage in dress shoes this year. And this continental inspired Iron Age "*Low-lo*" is made with a host of quality features to match its rich appearance. These include long-wearing "Leatherplus" soles, Pacifate vamp linings, leather toe linings and thermo-plastic counters to assure ankle fit and comfort. Just stock and show this outstanding Iron Age safety shoe value. Your employees will wear it in pride and comfort and with toe protected safety.

Iron Age SAFETY SHOES

IRON AGE DIVISION • H. CHILDS & CO., INC. • PITTSBURGH 12, PA.

Introducing the
SAFETY LEADERS OF 1956

Winners of first-place plaques in National Safety Council's Sectional Contests

A NEW LOW frequency rate of 5.95 disabling injuries per million man-hours worked was reported for 1956 by 4,235 entrants in 17 industrial groups in which contests were held.

The combined frequency rate for winners of National Safety Council plaques was .85—approximately 14 per cent of the average rate for all contestants.

For 1955 the frequency rate for 4,173 entrants was 6.45. Among winners of plaques the combined frequency rate was .89.

The companies listed below are those which will receive first-place plaques according to the rules of the contest in their own industry.

In the Barge and Towing Vessel, Chemical, Fertilizer, Hospital, Petroleum, Printing and Publishing, Textile, Commercial Vehicle, Glass and Ceramics, and Transit contests, first-place plaques are awarded only to the unit operating the largest number of man-hours in cases where several of the contributors have established perfect records.

In other contests, all companies or plants with perfect records receive duplicate first-place plaques.

In addition to the contests listed here, competitions are also conducted by the Metals Section and the Meat Packing, Tanning and Leather Products Section on a fiscal year basis, July 1 to June 30.

Complete lists of all winners, plus second and third place winners and companies receiving certificates of merit for perfect records, appear in the contest bulletins which are being sent to all participating companies and plants.

Each bulletin also contains a brief analysis of experience in the industry and a coded list permitting each non-winning company to identify its own record and compare it with others.

THE HOSPITAL CONTEST

The Hospital Section Safety Contest was sponsored jointly by the American Hospital Association and the National Safety Council. In addition to plaques for first, second and third place, a grand award for the section was won by St. Mary's Hospital, Montreal, Canada.

First place plaques were presented to:

Group I—Shenandoah Hospital, Roanoke, Va.

Group II—Burlington Hospital, Burlington, Ia.

Group III—Middletown Hospital Assn., Middletown, Ohio.

Group IV—St. Anthony Hospital, Denver, Colo.

Group V—City Memorial Hospital, Winston Salem, N. C.

Group VI—Milwaukee Hospital, Milwaukee.

Group VII—Good Samaritan Hospital, Phoenix, Ariz.

Group VIII—Brockton Veteran's Administration Hospital, Brockton, Mass.

AERONAUTICAL INDUSTRIES

COMPLETE AIRCRAFT MANUFACTURING

Convair, a Division of General Dynamics Corp., Pomona, Calif.

AIRCRAFT PARTS MANUFACTURING

Group A—NACA, Lewis Flight Propulsion Laboratory.

Group B—Northrop Aircraft, Inc., Anaheim Div. and Muroc Facility (two awards).

BARGE AND TOWING

Group A—United States Steel Corp., River Transportation Dept., Clairton, Pa.

Group B—Socony Mobil Oil Co., Western River Fleet.

CHEMICAL

DIVISION I

Group A—E. I. du Pont de Nemours & Co., Chattanooga Plant.

Group B—E. I. du Pont de Nemours & Co., Toledo Finishes Plant.

Group C—E. I. du Pont de Nemours & Co., Rayon Research Laboratory.

DIVISION II

Group A—The Chemstrand Corp., Acrilan Manufacturing Plant.

Group B—E. I. du Pont de Nemours & Co., Grasselli Works.

Group C—Koppers Co., Inc., Penacol Plant, Chemical Div.

DIVISION III

Group A—General Mills, Inc., Chemoil Plant, Kankakee, Ill.

Group B—Canadian Industries Limited, Edmonton Works.

Group C—Detrex Chemical Industries, Inc.

COMMERCIAL VEHICLE

COMMON AND CONTRACT CARRIERS DIV.

Group A—The Mason & Dixon Lines, Inc., Kingsport, Tenn.

Group B—Treloar Trucking Co., Joliet, Ill.

FERTILIZER

DIVISION I

Group A—Canadian Industries Limited, Chatham Works.

Group B—Virginia-Carolina Chemical Corp., Jacksonville, Fla.

Group C—Canadian Industries Limited, Halifax Works.

DIVISION II

Group A—Davison Chemical Co., Div., W. R. Grace & Co., Perry, Ia.

Group B—Canadian Industries Limited, Agricultural Chemicals Div., Beloeil Works.

DIVISION III

Group A—Swift & Co., Plant Food Div., South Norfolk, Va.

Group B—Georgia Fertilizer Co., Valdosta, Ga.

DIVISION IV

American Cyanamid Co., Brewster, Fla.

FOOD

DIVISION I

Group A—General Mills Inc., Flour Mill, Minneapolis; General Foods Corp., Gaines Plant; Ralston Purina Co., Fort Worth Branch.

Group B—General Mills, Inc. (four awards): Feed Mill, Rossford, Ohio,

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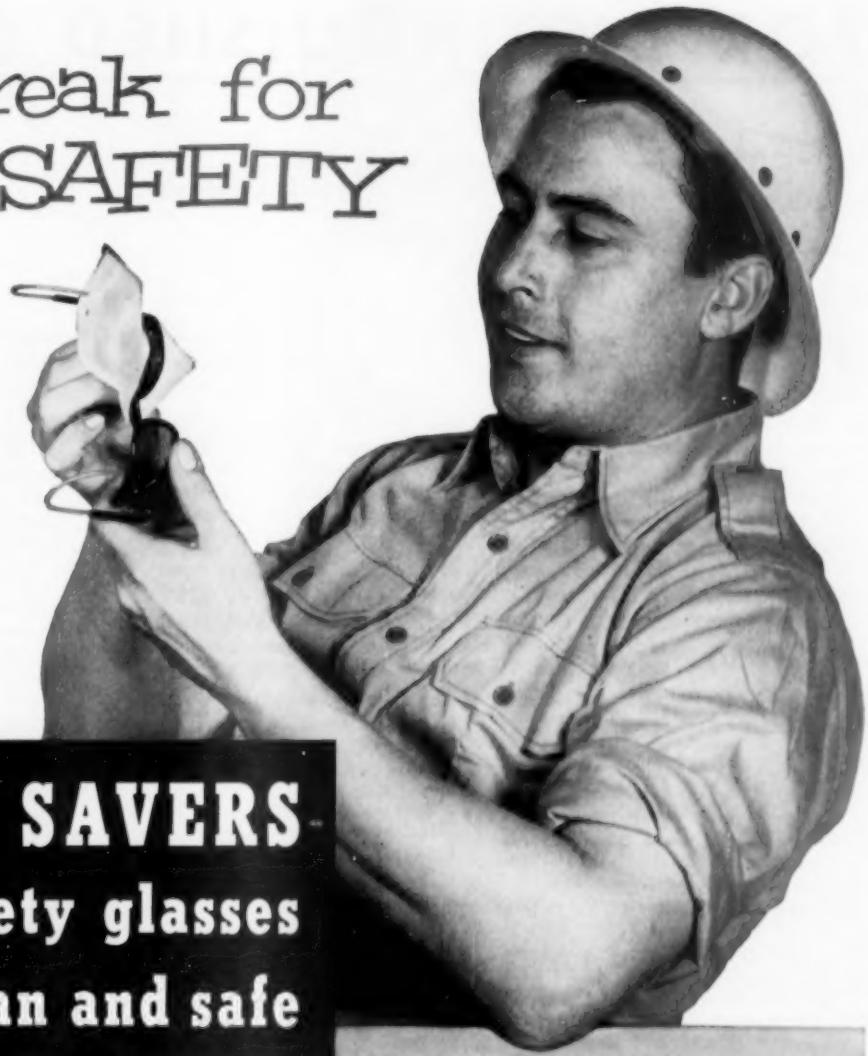
Best break for EYE SAFETY



SIGHT SAVERS keep safety glasses clean and safe

Cleaning Stations (value $2.50 ea.) **FREE** with your purchase of SIGHT SAVER tissues.

SIGHT SAVERS are the silicone-treated tissues known and preferred by millions as the easiest, most efficient way to clean and polish eyeglasses. Put **SIGHT SAVERS** at everybody's fingertips — they wipe away the best excuse ever given for not wearing safety glasses... improve morale and efficiency.

SIGHT SAVER Cleaning Stations are . . .

- Compact, save space—overall size 3½ x 8".
- Easy-to-install—screw or adhesive mounting.
- Easy-to-use — no fuss, no fluid — dispenses just one ready-to-use 3 x 7" tissue at a time.
- Easy to maintain—just insert refills of SIGHT SAVER No. 65 tissues as needed.
- Attractive looking—steel construction, foolproof mechanism.
- Available in 3 colors—safety green, white and black.

Distributed through leading Safety Supply Houses

Install SIGHT SAVER Cleaning Stations at convenient locations throughout your plant and offices

FREE *for your personal use*— handy Dispenser Pak containing 200 large 3 x 6" SIGHT SAVERS — Write Dept. 8017

DOW CORNING SILICONES first in Silicones

Dow Corning Corporation • Midland, Michigan

Dow Corning Silicones Ltd. Toronto, Ontario

FOR DISTINGUISHED SERVICE

National Safety Council awards for outstanding records

THREE TYPES of awards are given by the National Safety Council to industrial units in recognition of outstanding performance in accident prevention:

1. **THE AWARD OF HONOR** is available to units whose records, though not perfect, meet rigorous standards of excellence. These standards take into account the previous experience of the unit as well as the experience of the industry in which it operates. A unit must qualify on both frequency rate and severity rate. The Award of Honor is available also to units which complete 3,000,000 man-hours without a disabling injury.

2. **THE AWARD OF MERIT** has similar, but less exacting requirements. Minimum number of injury-free man-hours needed to qualify is 1,000,000.

3. **THE CERTIFICATE OF COMMENDATION** is available only for injury-free records covering a period of one or more full calendar years and totaling 200,000 to 1,000,000 man-hours.

Details of eligibility requirements may be obtained by writing to the Statistics Division, National Safety Council.

AWARD OF HONOR

ACF Industries, Inc., Two Awards: Erco Div., Riverdale (Md.) Plant; Mfg. Railroad Cars, New York.

Aluminum Co. of America, Fabricating Works, Nassena, N. Y.

American Airlines, Inc., Two Awards: Flushing, N. Y., Line Maintenance, Flushing, N. Y.

American Cyanamid Co., Five Awards: Brewster (Fla.) Plant; Latrobe (Pa.) Plant; Lederle Laboratories Div.; Pearl River, N. Y.; Piney River (N. Y.) Plant; Wallingford (Conn.) Plant.

American Factors, Ltd., Consolidated Terminals, Ltd., Hawaii.

American Potash & Chemical Corp., Trona, Calif.

American Welding & Manufacturing Co., Warren, Ohio.

B. F. Goodrich Co., Aviation Products, Akron, Ohio.

Budd Co., Hunting Park Plant, Philadelphia.

C. Brewer & Co., Ltd., Three Awards: Hilo Sugar Plantation; Kilauea Sugar Plantation; Pepeekeo Sugar Co.

California & Hawaiian Sugar Refining Corp., Ltd., Crockett, Calif.

Campbell Soup Co., Camden, New Jersey.

Canadian Forest Products, Ltd., Howe Sound Pulp Div., Port Mellon, B. C.

Canal Zone Government—Panama Canal Company, Five Awards: All Bureaus; Health Bureau; Marine Bureau; Supply & Employee Service Bureau; Transportation & Terminals Bureau.

Celanese Corp. of America, Chemical Fibers, Jalisco, Mex.

Celotex Co., Fiber Insulation Bd., Marrero, La.

Central Illinois Public Service Co., Public Utility, Springfield, Ill.

JAPANESE REFINERY wins National Safety Council's Award of Honor for 3,262,322 man-hours without a disabling injury. Y. Sasaki (left), president of Nippon Petroleum Refining Co., Ltd., presents plaque to T. Kuwabara, general manager of the Kudamatsu Refinery. Earlier this year the Japanese Minister of Labor presented the refinery with an award for 3½ million man-hours of safe operation.

Chemstrand Corp., Nylon Yarn, Pensacola, Fla.

Chicago Bridge & Iron Co., Greenville, Pa.

Cleveland Electric Illuminating Co., Cleveland Northern Ohio Area.

Continental Foundry & Machine Co., Chicago Works.

Corps of Engineers, U. S. Army, Three Awards: General Building Construction, Gravelly Point, Va.; Printing & Publishing, Gravelly Point, Va.; Corps of Engineers, Washington, D. C.

Crane, Ltd., Warden King, Ltd., Montreal, Quebec, Canada.

Crown Zellerbach Corp., Port Townsend, Wash.

Curtis Companies, Inc., Clinton (Iowa) Div.

Dayton Rubber Co., Plant 2, Waynesville, N. C.

Dominion Tar & Chemical Co., Ltd., Can Creosoting Co., Trenton, Ont.

Douglas Aircraft Co., Inc., Santa Monica (Calif.) Div.

Dow Chemical Co., Two Awards: Midland, Mich.; Texas Div., Freeport & Velasco, Tex.

Dravo Corp. & Subsidiaries, Machinery Div.

Eagle Ottawa Leather Co., Grand Haven, Mich.

E. I. Du Pont De Nemours & Co., Wilmington, Del.

East Bay Municipal Utility District, Oakland, Calif.

Edward Hines Lumber Co., Saw Mill & Manufacturing, Hines, Ore.

Emsco Manufacturing Co., Los Angeles.

Firestone Tire & Rubber Co., Seven Awards: Akron, Ohio; Bombay, India; Brentford, England; Defense Products, Akron, Ohio; Defense Products, Los Angeles; Des Moines, Iowa; Pottstown, Pa.

Fischer Lime & Cement Co., Memphis, Tenn.

General Dynamics Corp., Convair Div., Pomona, Calif.

General Electric Company, Three Awards: Cleveland (Ohio) Equipment Works; St. Louis (Mo.) Lamp Works; Trumbull Lamp Works, Warren, Ohio.

General Foods Corp., First Ave. Plant, Evansville, Ind.

General Motors Corp., Detroit, Mich.

—To page 169

"Pep-Up"
IMPREGNATED
SALT TABLETS
WILL NOT CAUSE SALT SICKNESS
FOR HEAT RELIEF
DIRECTIONS
Take one or two tablets with drink of water. Use four to six times daily as needed. Swallow WHOLE
TURN KNOB

new!

at no extra cost

- all-weather
- tamperproof
- sanitary
- economical

Two Sizes 500 or 1000 Tablets

Easily Mounted Indoors—Outdoors

ALL-PLASTIC EXPENDABLE DISPENSER

of High Impact Styrene—Colorful—Durable

for the SALT TABLETS ALL Employees Like!

Each Salt Crystal Individually Coated

"Pep-Up"®

The Original and Highest Quality

IMPREGNATED SALT TABLETS

- Stops Heat Fatigue
- Maintains Vitality in Hot Weather
- Impregnated to Prevent Nausea—Controlled Dissolving Prolongs Benefits
- Attractive Pink Color

WHY TAKE SALT TABLETS?

Sweating in hot weather or on hot jobs drains salt rapidly out of the system. Tests show that a salt loss of only 10% can lead to lassitude or "heat fag"—a major factor in the rise of the "hot weather accident" curve. In extreme cases, salt deficiency can result in serious heat exhaustion. "Pep-Ups" are quick, low-cost, popular insurance against these hot weather hazards.

FOR THE PAST 9 YEARS...

"Pep-Ups" have been made and packaged exclusively by USSSCO under Patent No. 2,478,182—the **original** U. S. Patent granted for impregnating salt crystals. These tablets meet all requirements of Federal Specification No. SS-S-31F.

Cat. No.	Impregnated Tablets	Quantity Prices 1-11	12-143	144-Up
1114	500 Tablets in Expendable Dispenser	$1.20	$1.17	$1.08
1124	1000 Tablets in Expendable Dispenser	$1.70	$1.67	$1.53

Packed: Case of 12 Dispensers

		1-5	6-47	48-Up
1131	1500 Tablets in Bulk Carton (To Refill Permanent Dispensers)	$1.50	$1.30	$1.13
1101	"Vest Pocket" Packet of 10 Tablets: Carton of 72 Packets: $3.60			

Combine items for quantity Prices. "Pep-Up" Enteric Coated Salt Tablets also available, in all above package sizes, at same prices.

Working for You to Make Safety Work

Be Prepared—Order Now. Your Complete order will be shipped promptly.

UNITED STATES SAFETY SERVICE CO.

BRANCHES IN PRINCIPAL INDUSTRIAL CITIES

Div. A-5—1215 McGEE ST., KANSAS CITY 6, MISSOURI

IN CANADA: PARMELEE, LTD., TORONTO & MONTREAL

THE ACCIDENT BAROMETER

Prepared by the Statistics Division, National Safety Council

All Accidental Deaths

The trend of accidental deaths in January was upward compared to 1956. The fatality toll was 7,600, or 1 per cent above 7,500 in January a year ago. There were increases in deaths from public non-motor-vehicle and work accidents, a decrease in motor-vehicle fatalities and no change in home accident deaths.

Motor-Vehicle Deaths

The motor-vehicle death total was approximately 2,860, or 3 per cent below January, 1956. However, compared to 1955, it was an increase of 2 per cent.

Mileage data are not available at this time to calculate a rate on this basis for January.

Of the 45 states reporting for January, 26 had fewer deaths than in 1956, 2 had the same number and 17 had more deaths. Reporting cities with populations of more than 10,000 showed a decrease of 15 per cent. Of the 562 cities reporting, 118 showed decreases, 359 had no change and 85 had increases.

Regional changes from 1956 in the January motor-vehicle death totals were:

North Atlantic	—10%
South Atlantic	+ 2%
North Central	— 9%
South Central	—10%
Mountain	+11%
Pacific	— 1%

Work Accidents

There were about 1,200 deaths from work accidents in January, or 100 more than occurred in January a year ago.

The January frequency rate (disabling injuries per million man-hours) in 11 sectional accident prevention contests conducted by the National Safety Council was 4.85, a decrease of 3 per cent from 1956. The frequency rate for plants in community council contests was 4.79, a reduction of 13 per cent from last year.

Public Deaths

The January death total for public non-motor-vehicle accidents was 1,100, or about 100 more than occurred in 1956. There were increases in deaths from drowning and transportation accidents and decreases in fatal burns and firearms accidents. Most of the increase occurred among children under 15 years of age, but deaths of persons 25 to 44 and 65 years and over also were more numerous.

Home Deaths

The home accident death toll for January was 2,600—about the same number as in January a year ago. Increases in fatal poisonings and firearms accidents were offset by decreases in falls and mechanical suffocation deaths. Burns showed no change from last year. There were more deaths reported for children under 5 years of age and persons 25 to 44 and 45 to 64 years old. Other age groups showed decreases with the largest change recorded for children 5 to 14 years of age.

Army Engineers Develop Crevasse Detector

ARMY ENGINEERS have developed a device that locates crevasses—camouflaged Arctic "canyons" with enormous appetites for men, equipment and supplies.

Developed by the Engineer Research and Development Laboratories, Fort Belvoir, Va., and the Southwest Research Institute of San Antonio, Tex., the unit creates a low frequency electromagnetic field which is distorted by the presence of a crevasse.

Basically, the device consists of 4 "electrodes" placed at approximately 20-ft. intervals. Its workhorse is a Weasel, an over-snow vehicle that carries special electronic equipment, moves 3 electrodes in the form of disk-shaped sleds about 4 sq. ft. in size, and acts as an electrode itself.

The search-head is pushed ahead of the Weasel. The other sleds are towed behind. The rearmost sleds combine to create the electromagnetic field. Power is provided by a generator carried on the sled initially behind the vehicle.

For practical application, multiple electrodes are provided to produce alternate configurations for optimum detection over varying snow conditions and crevasses. Provisions are also made to power the electrodes from the vehicle.

The detector located all known crevasses and some new ones during tests covering more than 100 miles of the Greenland Ice Cap last summer. A detector made from Army Engineer drawings was also used with much success by members of the Navy's Task Force 43 operating in the Antarctic.

Eventually, the Engineers hope to have a detector that will stop the Weasel automatically as soon as the search-head finds a crevasse, and will provide data on the depth, width, strike and bridge thickness of the crevasse.

Crevasses are usually hidden by a cover of snow. Arctic explorers report the existence of crevasses 100 ft. wide and 150 ft. deep. Expeditionary forces live in constant fear of them.

Don't worry about the job you don't like—someone else will soon have it.

No brain is stronger than its weakest think.

S-4359—Woven blucher. Rich, deep shade of Lariat Tan. Leather-lined steel toe box. Nitro-Crepe sole and heel. (Other summer styles available.) B 8-12, C 7-12, D 6-12, E 6-12.

Beat the heat in style and safety with this Thom McAn safety shoe

ONCE MORE Thom McAn has taken a shoe out of the leisure class and put it on a 40-hour week.

Look. See that woven effect? That allows the air to circulate through the leather, making this just about the coolest safety shoe a man ever slipped his foot into. What's more it offers your men the same rugged leather-lined steel toe box, sturdy leather, and careful workmanship that they get from every Thom McAn safety shoe.

One more thing about this shoe. It's styled to go places after work—and make it a pleasure.

Here's one more good reason why Thom McAn is the best-selling shoe in all America.

NOW SOLD THREE WAYS: 1. Directly from Thom McAn warehouses for plant inventory, or on mail-order basis. **2.** Through Thom McAn's special In-Plant Fitting Plan. **3.** At Thom McAn Shoe Stores. Send today for details on Thom McAn's special money-saving plans—plus a full description of the new Thom McAn Safety Shoe line.

Write: Thom McAn Safety Division, 25 West 43rd Street, New York 36, N. Y.

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Thom McAn

SAFETY SHOES

A Division of Melville Shoe Corporation

CONSULTATION CORNER

By George MacDonald, *Industrial Department, NSC*

Got a problem in accident prevention or occupational hygiene? Questions are answered by mail, a few of general interest being selected for publication here

Wrong Kind of Pipe For Oxygen

Question. We are considering piping oxygen gas through existing carbon steel pipe within our chemical plant. What about reducing fire hazards by diluting the oxygen with an inert gas?

Answer. A search of the material in our library revealed no data or recorded experience with reducing the fire hazard by diluting oxygen gas with 30-50 per cent of an inert gas.

From a *safety standpoint*, the idea of piping any concentration of oxygen gas through carbon steel pipe is highly undesirable even under special conditions.

From a *technical standpoint*, the reduction in potential fire hazard by the use of 50 per cent inert gas can be achieved by reducing the oxygen pressure in the line by 50 per cent.

It would seem that the problem of removing the inert gas from the oxygen at the delivery point would be so great as to eliminate this as a practical possibility.

The potential risk of losing an entire plant as a result of piping oxygen through carbon steel pipe is far too great to warrant the use of this type pipe in order to save a few dollars or a little installation time.

Knees for Lifting?

Question. In our plant there seems to be some difference of opinion regarding the use of the knee in lifting heavy objects, such as sack material weighing from 40 to 100 lbs.

We are wondering if it is common practice in some operations to instruct employees to use their knee to help boost heavy loads, especially when lifting them for placement at chest level or higher.

Current lifting instruction stresses following the example set by professional weight lifters—that of lifting from a crouch, hoisting the load up to the chest (if a high lift is involved), and then straightening up the legs. In this method both feet are kept solidly planted at all times. We understand some instruction actually *warns against* using the knee, stressing that the momentary instability incurred when the employee is balanced on one leg leaves him extremely vulnerable to injury.

Answer. We quote from page 18-2 of the third edition of our *Accident Prevention Manual:*

"When a worker has to raise an object to shoulder height or higher, he should first lift to about waist height, rest one end of it on a ledge or bench, and then if necessary shift the position of his hands to accomplish the lift to the higher level. Keeping his knees bent when he starts to raise the object to the higher level will give added power to the lift."

We have never heard of recommending that employees use their knee to help boost heavy loads, and strongly doubt that any such practice has ever been recommended in any National Safety Council publication. The quoted paragraph represents the practice the Council does recommend. We believe it is essential in all lifting to keep both feet solidly planted on the ground at all times.

The accompanying illustration, NSC poster 8182-A, shows the correct way to lift heavy sacks.

Setting Up a Preventive Maintenance Program

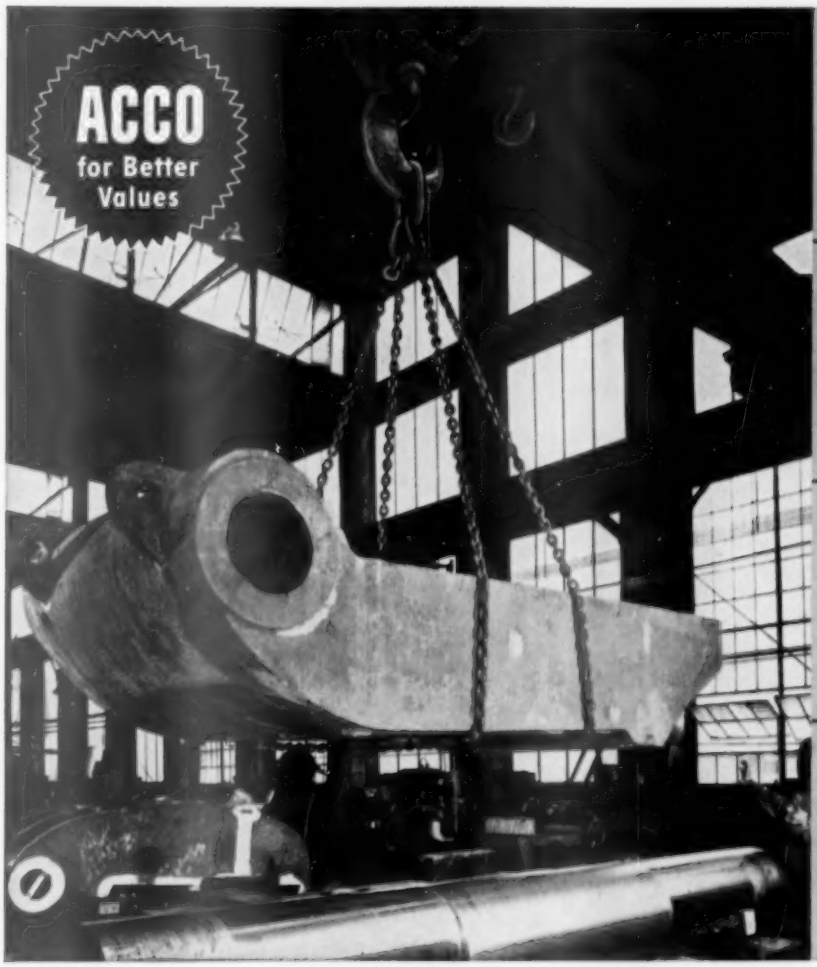
Question. We are contemplating putting in a preventive maintenance program, and would appreciate your comments, particularly on suggested time schedules for inspection of plant and equipment.

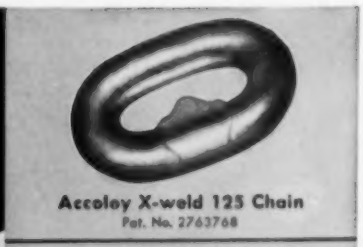
Answer. It would be nice if we could give you suggested time schedules for inspections, but it isn't that easy. This is a part of the tailor-made process of building a PM program that everyone has to do for himself. Over-inspection is a needless expense and may involve more productive down-time than an emergency breakdown. Under-inspection results in more breakdowns, and more lost time. Balance is needed to bring maximum savings.

We think that you must work out your own values—no one can do it for you. No two plants are alike. Consideration is given to the age of plant, kind of equipment, environment, types of operation and similar factors.

You can get helpful timetables from many equipment and materials manufacturers. However, suppliers are careful to qualify their recommendations by saying that the tables apply to normal conditions. They may describe what these normal conditions are. Then they'll suggest that you trim the normal figures by various percentages for special exposures or types of service.

To determine frequencies of servicing, such as once daily for cleaning, once weekly for adjustment, once monthly for functional inspection and once yearly for overhaul, we would suggest you start with an engineering analy-





Accoloy X-weld 125 Chain
Pat. No. 2763768

New Shaped Master Link

ACCO Registration Ring

Registration Certificate

Big, costly loads are safe with Acco Registered® Sling Chains

• Pictured above is a huge, 35,000-pound casting being lifted *easily and safely* by a 4-leg ACCO *Registered* Sling Chain. Directly beneath the load is a highly polished and machined crank shaft worth many thousands of dollars.

Imagine the cost in lost labor and materials, should the sling chain fail! But it won't fail—for this ACCO *Registered* Sling Chain and all its components have the inbuilt strength needed to handle the job with complete safety!

When you buy an ACCO *Registered* Sling Chain, you get these four exclusive "plus values" which *add materially to the worth, but not to the cost,* of the sling:

1 • **Accoloy X-weld 125 Chain**, for extra strength. This chain hangs straight . . . does not kink . . . has extra resistance to bending.

2 • **New Shaped Master Link**, uniquely shaped to withstand deformation under loads up to 18% greater than a round-section link can do.

3 • **ACCO Registration Ring**, serially numbered as evidence that the assembled sling has been factory proof-tested to twice its working load limit.

4 • **Registration Certificate**, signed by us, attesting to the field-tested design and proof-testing of the complete sling.

Remember, the best sling is one of your most economical material-handling tools. You'll find it good business to consult your ACCO *Registered* Sling Chain Distributor on all your sling needs; his counsel is available without obligation. If you don't know his name, write us at York, Pa.

WHAT "ACCO REGISTERED" MEANS

1 The best material
2 Unit safety factor (on bodies, rings, links, hooks)
3 Proof test of complete sling to twice the working load limit
4 Actual field service test of each design
5 Metal identification ring on each sling
6 Signed Registry Certificate with each sling

American Chain Division

AMERICAN CHAIN & CABLE

Bridgeport, Conn. • Factories: *York and *Braddock, Pa.

Sales Offices: *Atlanta, Boston, *Chicago, *Denver, Detroit, *Houston, *Los Angeles, *New York, Philadelphia, Pittsburgh, *Portland, Ore., *San Francisco

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ACCO

"double S-d"—improved Sol-Speedi-Dri, now green-flecked to tell you you've bought the best—is found in the smoothest-running plants everywhere, helping to cut housekeeping and production costs and keeping plant floors clean, dry and safe.

Here's why Sol-Speedi-Dri does more . . . does it better:

ABSORBS—thirsty for all liquids as well as oils and greases

RETAINS—power to hold; no "leaks" and "bleeds"

COVERS—most efficient volume-per-pound floor coverage

RESISTS—doesn't become "mushy"; won't cake, mat or break up in use

DUSTLESSNESS—the most dust-free mineral floor absorbent sold today

UNIFORM—bag after bag, ton after ton, carload after carload

Green-flecked double S-d is available within hours from distributors everywhere. Check coupon, clip to your letterhead, and mail to SPEEDI-DRI DIVISION, Minerals & Chemicals Corp. of America, 1183 Essex Turnpike, Menlo Park, New Jersey.

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sis. You will find a wealth of data on inspection frequencies for any type of equipment. The big job is to assemble them, weed out what you need, then temper it to your plant conditions.

Your engineering analysis should consider the following points:

1. *Age, condition and value.* Older and poorer equipment needs more frequent services. If it's ready for the junk pile, it may be cheaper to inspect on a skeleton basis or not at all, as long as the breakdown won't cause injury.
2. *Severity of service.* Severe usage of equipment requires shorter cycles. For example, maybe one of your pumps needs inspection every day but the same pump in another plant may need it only once a month.
3. *Safety requirements.* Allow a wide margin for safety. For example, one plant inspects the solenoids operating the clutches on presses every two weeks.
4. *Hours of operation.* Many manufacturers suggest frequency cycles based on an eight-hour day, others on usage (such as mileage). Sometimes two bases are used, whichever comes first.
5. *Susceptibility to wear.* What is the exposure to dirt, friction, fatigue, stress and corrosion? What is the life expectancy?
6. *Susceptibility to damage.* Is it subject to vibration, overloading, abuse?
7. *Susceptibility to losing adjustment.* How will maladjustment or misalignment affect it? Where tolerances are tight, shorter inspection cycles are needed.
8. *Service records.* Dig out whatever data on costs and performance you have—equipment records, down time reports, routine maintenance schedules.
9. *Maintenance work orders.* Sort out completed orders by machines or functions, if you don't already have an equipment record.
10. *Craftsmen.* Get the benefit of their experience, including lubrication men.
11. *Operating heads.* Ask them how often they think service is needed.
12. *Quality control charts.* Product inspectors can point to main causes of rejects and spoilage.
13. *Other plants.* Try to get a list from those preferably in the same industry. Use it merely as a guide.

Once you get going on your PM inspection frequencies you will probably continually check the results and modify the cycles.

Section 14 of the National Safety Council's *Accident Prevention Manual* includes several pages on plant maintenance problems, work schedules, inspections, maintenance crews, etc.

Flaming Hoses Cause Welder's Death

Question. We would like your comments and recommendations for preventing future accidents such as happened at one of our facilities recently.

A tank trailer had been checked, tested and made ready for repairs. Employee "A," the welder, was working inside the tank, in the forward compartment, using an acetylene cutting torch, while employee "B" was stationed on the top of the tank by the manhole, according to standard tank procedures.

It appears that as employee "A" was cutting inside the compartment the oxygen and acetylene hose lines were pulled quite taut. When employee "B" noticed this on the top of the tank, he turned to pull additional length of the hose into the tank to give "A" more hose with which to work. As he turned, he heard "A" yell and looking into the tank, could see flames.

Apparently the acetylene and oxygen hoses had been burnt behind "A" and when separated from the cutting torch end of the hose, had come loose and ignited. Under pressure from the gas cylinders, they were flailing around the tank, igniting "A's" clothing.

In trying to assist "A" from the tank "B" received first degree burns and was knocked from the top of the tank before he was able to assist "A" from the tank.

After two or three attempts

—To page 166

Announcing the

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PHARMACEUTICAL GRADE

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AROUND THE COMPASS

ACTIVITIES • PROGRAMS • EVENTS

By George W. Harris

Field Service Department, NSC

New Council on Long Island

The recently organized Nassau-Suffolk County Safety Council, Garden City, Long Island, will hold its first Annual Safety Convention and Exhibition on May 14 at the Garden City Hotel.

Ned H. Dearborn, president of the National Safety Council, will be the main speaker.

The Council was organized under the auspices of the Long Island Association. Thomas R. Goodfellow, president of the Long Island Railroad, is chairman of the board. Jack Bainbridge is managing director.

The new Council will function in the industrial field, as well as traffic. Gordon L. Bowen, assistant personnel manager, Arma Division, American Bosch Arma Corp., is vice-president and chair-of the Industrial Committee.

Idaho Considers Expansion

The Idaho Chapter, NSC, is polling its members on a change in its by-laws which would permit the addition of a vice-president for traffic and the addition of three standing committees: highway traffic, farm, and home safety.

If the membership approves, the Idaho Chapter will work in these areas, in addition to its industrial program.

Women's Club Studies Vision-Accident Histories

Members of the Hammond, Ind., Junior Women's Club have just finished the day and night job of comparing the vision and accident history of 2,500 Hammond drivers. The young ladies had to start a night shift on the project when it was discovered that limited space and facilities at the police station hampered daytime operations.

The women pored over accident records dating back several years, comparing them with visual tests made through the cooperation of the Hammond Traffic School and the local drivers license examiners. Club members also helped process vision examinations at the Traffic School and for license applicants to get the needed data.

Purpose of the project was to determine the correlation between vision and accident history. The information they gleaned will be turned over to analysts at Purdue University.

McCauley Resigns

James McCauley has resigned as manager of the Omaha Safety Council and is returning to his home in Salt Lake City. His successor has not been named.

Jacksonville Adds Water Safety

A Water Safety Division has been added in the Jacksonville-Duval County (Fla.) Safety Council.

GIRL SCOUTS attend Safety Sitters Course sponsored by the Family Division of the Twin Cities Area Safety Council. They are shown with some of the "safe toys" they made to receive credit toward their child-care badges.

Wisconsin Doctors Study Traffic

The State Medical Society of Wisconsin has created a new Division of Safe Transportation to determine whether member physicians can help curb traffic accidents in the state.

The doctors will attempt to provide answers to such questions as: Does imperfect health cause a significant number of traffic accidents? What can be done about such major accident causes as errors in judgment, speed and alcoholism? Are tinted windshields dangerous, especially for older drivers?

The physicians' group is working in close liaison with the Motor Vehicle Department.

NSC District Representatives

Alton P. Bunderson, 6505 Fairfield St., Boise, Idaho. Phone: 4-4647. (Wash., Mont., Ore., Utah, Idaho)

James E. Civils, 811 E. John Wesley St., College Park, Ga. Phone: PO 7-9230. (Ala., Ky., Fla., Miss., Ga., S.C., Tenn.)

George E. Grotz, 130 Devonshire Rd., Fairfax, Wilmington 3, Del. Phone: OL 2-7345. (Del., N.C., Md., Va., N.J., W. Va., D.C.)

John C. Hall, National Safety Council, 703 Market St., Room 250, San Francisco 3. Phone: EX 2-0945. (Ariz., Nev., Calif.)

George W. Harris, National Safety Council Headquarters, 425 N. Michigan Ave., Chicago 11. Phone WH 4-4800, ext. 361. (Ind.)

James D. Hill, 3276 Darvany Dr., P.O. Box 13361, Dallas, Tex. Phone: FL 1-6609. (Ark., La., Mo., Okla., Tex.)

Robert D. Hopper, 6348 Teller, Arvada, Colo. Phone: HA 4-1383. (Wyo., Colo., N.M., Neb., Kan.)

Norman A. Olman, 253 Lexington Ave., Grand Rapids, Mich. (Mich., Ohio)

Edwin S. Smith, 32 Wedgewood Dr., Rochester 11, N.Y. Phone: GE 8-9056. (N.Y., Pa., Ohio)

Philip N. Streit, 504 S. 11th St., Adel, Iowa. Phone: 147LW. (Ill., Iowa, S.D., N.D.)

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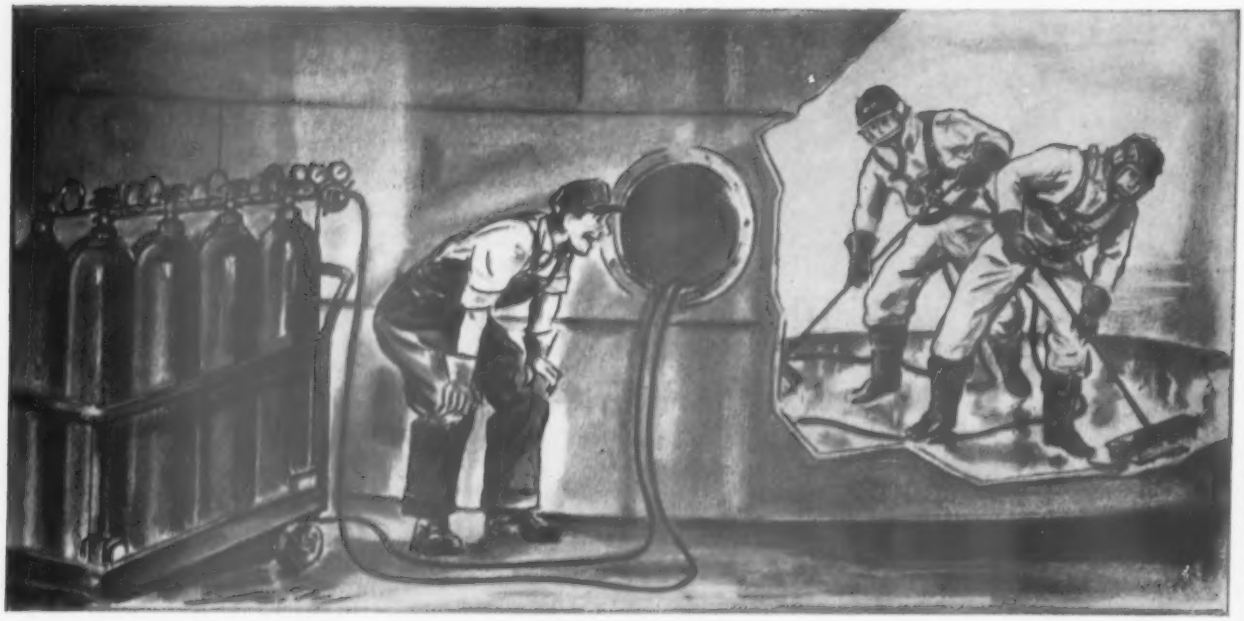

Illustration shows the Scott Pressure Demand Air-Pak in use. The gasoline storage tank being safely cleaned contains hazardous sludge. The man in charge of the air cylinders also watches the men in the tank, thus reducing a tank cleaning team from four to three men. The result in terms of man hours saved, makes Scott Pressure Demand Air-Pak first in economy too!

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Research and Development *Scott First* to make operations *Absolutely Safe*

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Let us give you the complete story — the many other money saving, man saving features of this modern breathing equipment. Use coupon or write today!

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Make the Tool Crib a Safety Center

By WILLIAM RAISGLID

It's a convenient place to issue safety equipment and it helps to have men associate it with production tools

EXPERIENCE indicates that many industrial workers are not well enough acquainted with safety equipment.

Almost every day, a new process or operation creates new safety problems in plants and shops.

Some standard pieces of safety equipment—such as protective gloves, grinding goggles, welders' goggles, helmets, masks, and respirators for protection against paint and chemical dust, Plexiglas chip shields on machines, and punch-press guards—are required for almost every job.

It is important that the worker associate safety equipment with other tools and equipment. The placement and importance in the shop of the tool crib make it the most convenient place to distribute safety equipment.

The practice in industry is to keep several chemical products in the tool crib, including many poisons, among which the most common are carbon tetrachloride, benzol and other irritating cleaning fluids; copper sulphate, kasenite (used in powder or balls for hardening steel), soldering flux, acids, shellac, varnish, rust and paint removers.

The dangers of these chemicals may be illustrated by examining properties of carbon tetrachloride, industry's most dangerous solvent chemical. This compound is used in shops and plants for cleaning grease and other sticky substances. Although a useful product, its fumes are kidney and liver poisons that attack the nervous system and the heart and other muscles. The liquid itself, when used to extinguish fires, may form phosgene, a highly poisonous gas. Labels on containers of the chemical should clearly indicate dangers to be encountered in its use and provide more adequate instructions.

The tool crib, while not the center of machining activity, is often the scene of accidents caused by a lack of caution usually present in the shop. Here, materials for the entire shop pass quickly through many hands.

Tool-handling Dangers

And with the transfer of each tool, the inexperienced attendant faces the danger of a burn, bruise, cut, puncture, or serious accident caused by dropping heavy pieces. Such accidents may be avoided, however, if the attendant is acquainted with potential dangers tool handling presents.

In placing lathe chucks, die heads, arbors, shafts, adapters, gears and other heavy parts on shelves, care should be taken that bystanders are not injured if a part rolls.

Large drills, reamers, counterbores, end mills and other cutting tools, too, are hazards. They should not be gripped on cutting ends, but rather on their shanks. Chips on tools also are dangerous in that they may enter the skin, causing infection.

Side-teeth milling cutters, fly cutters, angular cutters, circular saws, shell mills and similar tools should be gripped through the center hole with one finger to avoid cutting the hands. The same precaution should be taken with wire wheel brushes.

When removing metal-cutting or wood-band saw blades from their containers, care should be taken not to pull out a length of more than two inches more than required for the job. These containers are more easily stored and cuts caused by exposed teeth are avoided when a minimum of saw sticks out. Too, difficulty is involved in returning the saw once it has been pulled out. Workers may be reminded of this precaution when the container is issued.

To insure safety and facilitate quick service, aisles of the tool crib should be kept open and free from tools, machine parts, boxes and packages. Cabinet doors and drawers should never be left open. In the shelves section of the tool crib, care should be exercised to keep long tools—such as arbors, boring bars, jigs and fixtures—from protruding beyond the shelf-edge.

A serious accident might result from brushing against a projecting tool, especially if a sharp edge is exposed. Long pieces should be kept either in deep shelves or in a vertical position in a suitable location. Newly received material

—*To page 74*

WILLIAM RAISGLID is author of the book, *Better Tool Crib*, recently published by The Industrial Press, 93 Worth St., New York 13.

COOL HEADS IN "HOT SPOTS" WON'T LET YOU DOWN

On jobs where the air is foul or hot, men can't be blamed too much for letting up now and then. If you want to keep their efficiency and morale high, feed them better air.

Employers have learned the value of putting Coppus Blowers and Ventilators on the job . . . in confined areas and near furnaces or hot processes. The men work faster, do better work, work longer without fatigue — and appreciate the more comfortable working conditions.

Give some thought now to the "hot spots" in your plant. There is a Coppus Blower for practically any requirement — Cable Manhole and Tank Ventilators, Boiler Manhole Blowers and Exhausters, Heat Killers, Shiphold Ventilators, etc. The Coppus "Blue Ribbon" is your assurance of design and construction planned for plenty of severe service. Check and mail the coupon for specific information. Coppus Engineering Corp., Worcester 2, Mass. Sales Offices in THOMAS' REGISTER. Other "Blue Ribbon" Products in BEST'S SAFETY DIRECTORY, CHEMICAL ENGINEERING CATALOG, REFINERY CATALOG.

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COMPANY.....

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(Write here any special ventilating problem you may have.)

There's a Better Way

—From page 21

FIGURE 6. Aluminized asbestos coat, helmet and mittens for high temperatures.

Protection from heat, particularly at the large high-temperature molybdenum wound box furnace, is well under control as shown in Figure 6. Mittens, coat and helmet are of aluminized asbestos and not too heavy. Two sliding shields on furnace doors, X, may be closed to a practical minimum, reducing radiated heat.

Figure 7 shows the tunnel with solid steel buffer end designed to contain extruded billets. Previously these could jump off the track or in some cases break up and fly in any direction.

Under the present setup at the Birdsboro Mill, it is impossible to place the control panel so the operator can have a full view of both processors. The choice is either a full view of one processor or the back portion of each with the rolls completely hidden. It is planned to correct this uncomfortable and dangerous state by installing two mirrors at a suitable height and set at a correct angle, affording the operator a full picture of both processors and the complete rolling operation.

These changes have made the fabrication laboratory a safer place to work despite the size and variation of equipment and the many kinds of work performed.

FIGURE 7. Tunnel and buffer plate to contain billets at extrusion press.

Either Way, The Cage Protects Him

WILLIAM KOEN, mechanic helper at the Pueblo (Colo.) Plant of the Colorado Fuel and Iron Corporation, demonstrates how ingenuity can prevent accidents. Faced with inflating a 1400 x 20 tire at 90 lbs. pressure and unable to fit the mammoth wheel in a cage used for such purposes, Koen did the next best thing—placing himself behind bars insuring his protection should a blowout send the rim flying.

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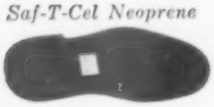

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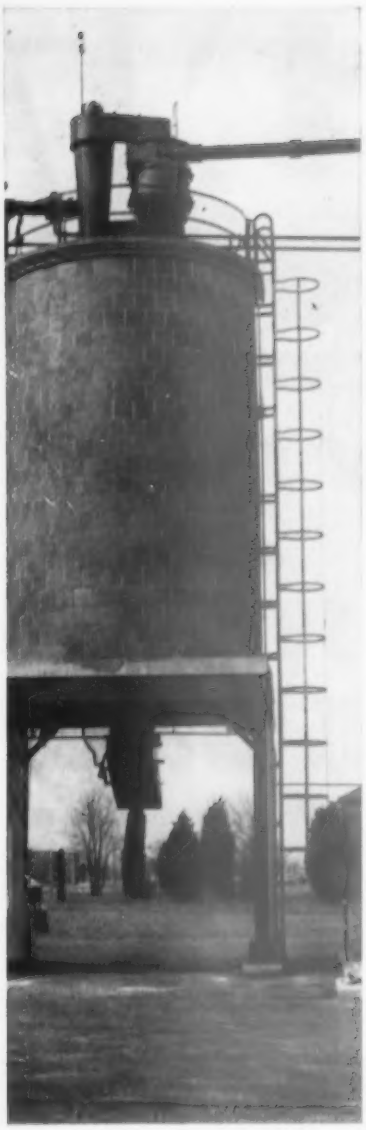


Code Sets Standards For Fixed Ladders

By ROBERT L. MOORE

A CODE recently approved by the American Standards Association provides general requirements for construction and care of fixed ladders. The code, American Standard A14.3-1956, *American Standard Safety Code for Fixed Ladders*, is the product of a thorough study of the design and construction of such ladders by the subcommittee set up by ASA's Sectional Committee A14.

ROBERT L. MOORE is Director, Technical and Engineering Division, Lumbermen's Mutual Casualty Company, Chicago, and chairman of the Subcommittee on Fixed Ladders that developed the new American Standard A14.3-1956.

The standard is intended to help establishments which use, design, or manufacture fixed ladders and to serve as a guide for state authorities and other regulatory bodies.

Some safety provisions for fixed ladders had been included in the *American Standard for Construction, Care, and Use of Ladders* from the time it was first approved in 1923 until the revised edition of 1948, although this standard was primarily concerned with wood ladders. This is now recognized, and the most recent edition of the original safety code is the *American Standard Safety Code for Portable Wood Ladders*, A14.1-1952. Provisions for both metal ladders and fixed ladders, finally removed from the original safety code, are now given consideration in separate standards. This action was taken because the committee believed that rapid development and industry acceptance in the metal ladder field warranted special consideration and treatment of fixed ladders (which are usually metal) and of portable metal ladders in separate standards.

Subcommittee A14.3 was created to review the data on fixed ladders originally contained in the code prior to the 1948 revision, to consider existing state codes, and to make any changes or additions necessary to conform with the requirements of all interested groups.

Controversial Points

The subcommittee's work brought out many interesting points, many of them controversial. One point emphasizes the importance of safety code coverages for fixed ladders. There has been no such code coverage for portable metal and fixed ladders since deletion of all reference to these types of ladders in the 1948 revision of the ladder code.

The new American Standard A14.3-1956 solves this problem for fixed ladders.

The location of ladder rungs in connection with landing levels came in for much discussion by engineers and designers. The question was: "Should a rung of any section of a fixed ladder be located at the level of the landing laterally served by the ladder, or should it be located 6 in. below the landing?" The same problem was discussed with regard to fixed ladders in cases where access to the landing is through the ladder.

Thinking Standardized

The new American Standard standardizes thinking on these situations by stating:

"One rung of any section ladder shall be located at the level of the landing laterally served by the ladder. Where access to landing is through the ladder, the same rung spacing as used on the ladder shall be used from the landing platform to the first rung below the landing."

Further research brought out the fact that most states had no codes governing safety for fixed and metal ladders. Now it is hoped that the various states will adopt the new standard.

Many industrial plants have fixed ladders. It would be advisable now for each plant to make a safety and engineering check of existing ladders to see if they comply with the standard.

The American Standard Safety Code for Fixed Ladders is one which provides engineering data in the form of design requirements. These data will assist the engineer or designer in the de-

—*To page 140*

On the Monongahela . . . New fireboat has Multigrip Floor Plate decks for all-weather safety!

On Pittsburgh's new 65-foot fireboat, the C. D. SCULLY, all exterior decks and ladders are surfaced with USS Multigrip Floor Plate. Mr. Leo Gill, Director, Automotive Equipment, City of Pittsburgh, says that "safety and endurance dictated the choice." In the event of river or wharfside fires, the *"Scully"* will run in close, directing gushing streams of water into the fire. Wind-blown spray *could* make this a treacherous job for firemen manning the equipment.

Risers Mean Safe Footing

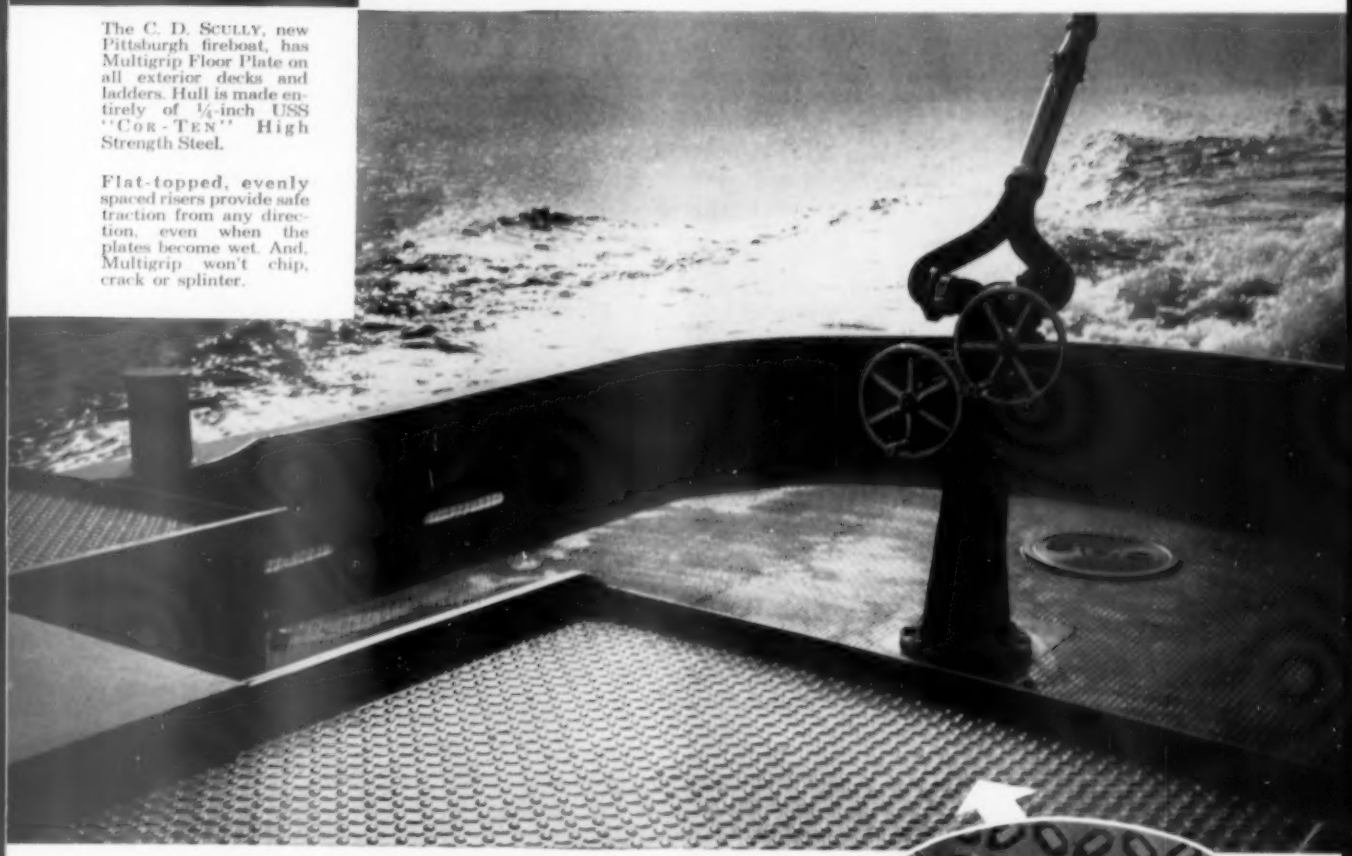
Because Multigrip has clean-edged, flat-topped risers that are evenly spaced, firemen will be able to move about the decks safely, even when the plates are wet. In short, use of Multigrip has made the *"Scully"* a safer, more efficient fire-fighter.

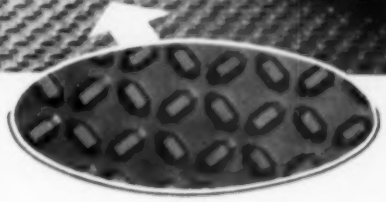
Your Plant, Too

This application demonstrates how Multigrip adds long-lasting safety under extreme conditions, just as it can in your own plant. You'll find that Multigrip won't chip, crack or splinter, and it offers traction from any direction. Multigrip can be cut, welded or bent where necessary . . . and installation is *fast!* And large plates mean less installation waste. For safety and long service, specify USS Multigrip Steel Floor Plate for trucking aisles, ramps, loading platforms, stairs and entire floor areas.

The C. D. SCULLY, new Pittsburgh fireboat, has Multigrip Floor Plate on all exterior decks and ladders. Hull is made entirely of ¼-inch USS "COR-TEN" High Strength Steel.

Flat-topped, evenly spaced risers provide safe traction from any direction, even when the plates become wet. And, Multigrip won't chip, crack or splinter.





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INDUSTRIAL HEALTH

Abstracts of current literature
on Occupational Hygiene, Medicine, and Nursing

By F. A. Van Atta, *Director, Research Division, NSC*

Diesel Fumes and Air Pollution

"The Toxicity of Fumes from a Diesel Engine Under Four Different Running Conditions." By R. E. Pattle, H. Stretch, F. Burgess, K. Sinclair and J. A. G. Edginton. *The British Journal of Industrial Medicine*, 14:47-55 (Jan. 1957).

SINCE INTERNAL combustion engines are thought to make a substantial contribution to atmospheric pollution, it was decided to investigate the main toxic constituents of the exhaust of diesel engines operating under a variety of conditions of fuel supply.

Animals were exposed to the exhaust at the same time that samples were collected for chemical analysis, so that the pathology observed in the animals could be correlated with the composition of the exhaust materials as determined by chemical analysis.

The engine, a single cylinder diesel, was run with only its accessories taking power, that is under very light load, with a substantial load and a worn fuel injector, and with a load with air supply cut down so as to operate the engine with an extremely rich mixture.

Chemical determinations were made for oxygen, carbon dioxide, carbon monoxide, total aldehydes, total particulent matter, total particulate acids, black smoke, vanadium and oxides of nitrogen. An attempt was made to distinguish between nitric oxide and nitrogen dioxide or nitrogen tetroxide as it is felt that their toxicities are different.

The animal experiments were run in an exposure chamber with a content of 10 cubic meters. The contents of the chamber were circulated by means of a fan and chemical analyses were run on samples taken from one of the two exhaust pipes leading from the chamber.

Probably the most significant finding is that the composition of the diesel exhaust gases varies according to the working conditions of the engine. Under a light load the toxicity appears to be due to irritants of the aldehyde type and to a less extent to nitrogen dioxide. Under a moderate load nitrogen dioxide is the most significant toxic material, and under a light load with a restricted air intake the toxicity is due to carbon monoxide mainly. There is no close relation between the toxicity of the exhaust and the tendency to produce lachrymation.

Another Point for Oldsters

"Age and Absenteeism." By Hilda R. Kahne, Claire M. Ryder, Leonids Snegireff and Grace Wishak. *AMA Archives of Industrial Health*, 15:134-147. (Feb. 1957).

AS THE PROPORTION of older people in the working population increases, the relative cost to the employer of employing an older rather than a younger worker becomes increasingly important and there is still no unanimity of opinion on this point. This is at least partly due to the lack of unanimity of opinion as to what constitutes an older worker. No one has exactly defined this yet. This article uses age 45 as the dividing line between older and younger workers.

Part of the cost of employment is involved in the relative amount of absenteeism. This has been studied here in a single plant employing 619 white workers, more than three-fourths of whom were men and 47 per cent of whom were 45 years of age or older. Most of the workers were American-born so that differing languages and customs were not a factor in fixing the amount of absenteeism.

It is a plant with stable employment and fairly skilled employment. Skilled and semi-skilled jobs accounted for 62 per cent. Three-fourths of the men were hourly rated employees and 59 per cent of the women were salaried employees and most of them were in clerical positions.

Hiring and retirement policies are strict. Conditions such as cardiac conditions, hernia, or back strain, which prevented adaptability to a variety of jobs, are bars to employment and retirement at age 65 is compulsory. A good medical department directs its attention to the maintenance of an efficient and healthy working force.

Both pay and disability provisions are fairly liberal. Salaried employees are entitled to full pay for sickness absence, beginning with the first day of absence. Hourly rated employees draw two-thirds pay after 5 days of absence and if the absence is more than 28 days the first 5 days are also paid. In spite of the more liberal absence pay for salaried employees their absence rate was lower than that of hourly employees.

The rates for male and female workers were considered separately.

In this company lost time from work is a problem related to a few workers rather than to many. One-fourth of the employees experienced no absence during the entire year, while less than one-fifth of the workers with the highest frequency in disability rates accounted for more than one-half of both absences and days lost. All workers under 45 made a more than proportionate contribution to these groups with high absence experience. A similar finding applied to the male and

—*To page 122*

Good news for everyone who works where there's danger of Heat Fatigue!

Now you can take Salt Tablets without feeling ill

You and your employees will like Morton Yellow Impregnated Salt Tablets. These are non-sickening salt tablets made by a special patented process that uniformly coats the individual salt crystals to control the dissolving rate of the tablet. This controlled dissolving rate means that essential body salt lost through perspiration begins to be replaced immediately, but at a gradual, non-nauseating rate.

When there's danger of Heat Fatigue, workers feel better, work better *and* more safely, when they take Morton Yellow Impregnated Salt Tablets. Remember, they do not cause stomach upset.

Complies with Federal Specifications SS-S 31f for Type III, Class C Impregnated Salt Tablets. U. S. Patent No. 2,665,236 Patented 1954 (Canada) No. 501,316.

Morton Yellow Impregnated Salt Tablets come in a handy Disposable Dispenser. A plastic dispenser and a new golden heavy duty dispenser are also available, as are plain salt tablets.

Mail coupon today for more information!

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Company_____

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MORTON SALT COMPANY

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Mr. Safety a "Big" Success

THE EXPLOSIVES Division of Canadian Industries Limited in Nobel, Ont., likes its safety publicity big. So when it decided to have a "Mr. Safety" make a surprise tour of the plant, the committee chose 6-ft., 4-in., 230-lb. Ivan Ryman, a nitroglycerine department operator, for the part.

Mr. Safety appeared a few days before the achievement of the C-I-L Prize, a company-wide accident prevention trophy for individual plants. He was elegantly attired in formal wear—top hat and tails, white tie and gloves—and carried a walking stick. Across his chest he wore a blue band emblazoned, "Mr. Safety."

He spent the day wandering casually around the plant, chatting with workers on the job and creating interest and enthusiasm wherever he went. He had a pocket full of theater passes which he gave to employees who were able to answer the questions, "What is the plant safety record?" or "On what date will Nobel win the C-I-L Prize?"

During the day, Mr. Safety also paid a few surprise visits to wives of employees who live in Nobel village.

The stunt was the idea of publicity committee members Harve Murdoch, Frank Taylor, and Hugh F. Dent. Mr. Dent is safety supervisor for the Nobel Works.

MR. SAFETY hands a free theater pass to Roy Haslehurst, power house fireman. Of course, they're both wearing safety glasses.

PRECISELY

CHARCO "NEO-SOL" all-neoprene gloves are precisely manufactured and tested . . . They are compounded precisely from formulae carefully developed in CHARCO'S own research laboratories.

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CHARCO "NEO-SOL" all-neoprene gloves offer a proven bonus in job efficiency and economy, through extra long life and superior hand protection.

FOR PROTECTION IN INDUSTRY

CHARCO "NEO-SOL" industrial protective gloves are recognized as outstanding in the field. They are solid black, with red lining and are available with either "Grip-Saf" hand or smooth finish. All have curved finger design to fit the hand naturally and permit added dexterity.

CHARCO "NEO-SOL" gloves are especially recommended for use in acids, alcohols, alkaline solutions, ethers, hydrocarbons aliphatic, phenolics, salts, oils and grease.

OTHER CHARCO INDUSTRIAL PROTECTIVE EQUIPMENT INCLUDES: "HY-SOL" SYNTHETIC RUBBER GLOVES, NATURAL RUBBER GLOVES, LINEMEN GLOVES AND SLEEVES, APRONS AND SLEEVES FOR CHEMICAL WORKERS, SAND-BLASTERS AND METAL WORKERS, SAFETY FLAGS AND CLAMPS.

FREE 28-PAGE INDUSTRIAL PROTECTIVE EQUIPMENT CATALOG
ALSO 32-PAGE LINEMENS' CATALOG
Please Specify Which You Desire

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CHARLESTON CHARCO SERVICE FOR SAFETY RUBBER CO.

Construction Firm Stops Accident Leaks

R. P. FARNSWORTH and Company, Inc., of New Orleans, was making money with one hand and paying it out with the other.

That's what management of the firm, one of the South's larger construction companies, realized. It realized, too, that its position in competitive contract bidding was unfavorable and that its insurance premiums weren't bringing reasonable returns.

In a year, with the help of the company's insurance representative, who, when consulted, helped develop a plan for safety, the firm had established an outstanding safety record. Most of its superintendents operated thousands of hours without disabling injury,

"Doc! It's like fighting DERMATITIS with an armored glove."

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– comfortable to wear
– easily washed away.

For skin exposed to oils, dust, grease and grime:
– use PROTECTIVE CREAM #211.

For skin exposed to acids, alkalies and inorganic chemicals:
– use PROTECTIVE CREAM #311.

For skin exposed to organic solvents, acetates and cutting oils:
– use PROTECTIVE CREAM #411.

WEST PROTECTIVE CREAMS protect against hundreds of troublesome industrial irritants. They're antiseptic. Inhibit harmful bacteria with Hexachlorophene. And they protect *for extended periods of time.*

How Convair stops Dermatitis before it starts

A simple safety precaution is preventing dermatitis at the huge $71,000,000 aircraft plant of Convair at Fort Worth, Texas. SAFETY ENGINEER S. A. GROSS (above) tells employees how to protect their hands against outbreaks of dermatitis with West Protective Cream #311. They cooperate – with their own well-being in mind. The result has been a reduction in the incidence of dermatitis to almost nil.

Would similar results interest you? Send the coupon.

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☐ Please have a West representative telephone for an appointment.

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Position.....

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Industrial Gloves

PROTECTION FOR WIL-GARD THE HANDS OF INDUSTRY

Recommended for Service in

OILS, GREASES, GASOLINE,
PAINT THINNERS,
CLEANING SOLVENTS . . .

Wil-Gard Neoprene Gloves provide excellent protection against petroleum solvents, naphthas, alcohol, lacquers, acetone, turpentine, cleaners, paint and varnish removers. Superior to natural rubber and natural latex compounds against oils, greases, and aliphatic solvents. Wil-Gard curved-finger styling for maximum comfort and flexibility. No deterioration from age or exposure to sunlight.

WIL-GARD Neoprene gloves are manufactured in nine styles—lengths from 11 through 18 inches; sizes from 7 through 12; light, medium, and heavy weights, and Smooth or Embossed Firm-hold finish.

NEOPRENE is an ideal protection material for the hands. It contains no allergens which often irritate sensitive skin.

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Includes application charts and detailed data on selecting sizes, weights, and finishes.

WR-557-11

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NOW...boom pendant assemblies with full catalog strength of the wire rope

Rugged J&L boom pendant assemblies with exclusive JalKlamp splices provide extreme strength, longer service life.

JalKlamp terminals are formed by hydraulically pressing the alloy sleeve around the rope. The metal in the sleeve flows into every space between the wires and the strands of the rope. The splice is up to 20% stronger than conventional splices.

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Investigate why J & L boom pendant assemblies last longer under toughest operating conditions. Send coupon today for complete information.

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☐ Please send information on J&L boom pendant assemblies.

☐ Have representative call.

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Jones & Laughlin STEEL

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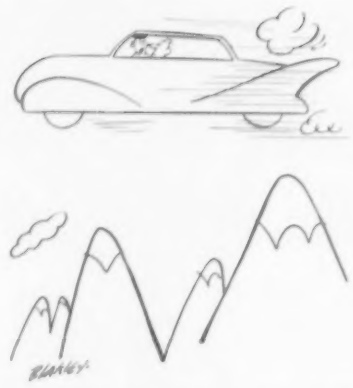
began safety-conscious supervision and generated genuine interest in safety in workers.

Farnsworth does light and heavy construction, building such structures as housing subdivisions in New Orleans; Dallas Auditorium; office buildings in Baton Rouge; medical buildings in Little Rock; a hospital in Biloxi, and other major structures elsewhere in the United States. Recently, the company had more than $31 million unfinished, contracted-for work.

Quite a contrast with its situation of a year ago, when it was plagued by accidents. Accent was on production, not protection. Superintendents had one thought in mind: Do the job fast and save money. Their loyalty to the company was unquestioned, but profit margins were diminishing.

First phase of the safety plan was to send to each job superintendent a personal letter from Farnsworth's vice-president, who explained the company's position regarding accidents and its need for support of a safety program which could benefit workers and supervisors—both in economic and humanitarian senses.

The executive explained, too, that a firm with a high accident return is not in a position to offer as low a contract bid as a competitor with a low accident rate.



"Dear, aren't you driving a little fast?"

One of the initial safety rules instituted was wearing hard hats. A professional engineer inspected jobs periodically. Safety meetings were held where a great accident exposure existed. Superintendents were reminded of the cost of nail accidents, importance of proper scaffolds and indirect costs of accidents. Good housekeeping and use of protective equipment was emphasized. Results of the effort finally paid off:

In 10 months, three persons—all candidates now for the select "Turtle Club"—were saved from injury or death by the hard hats.

Two superintendents and their personnel were awarded safety plaques and cash rewards for having the lowest injury-frequency rate in their operations.

Accident experience improved to a point where it had dipped some 40 per cent over 1955's figure. The company estimated its savings on insurance costs as about 50 per cent.

And management has retained its enthusiasm. It plans to institute a field-training program for safety and a safety incentive plan whereby employees will benefit from good safety records.

To sum up the company's sentiments, Philip Farnsworth, executive vice-president, said: "Safety has paid off for us and will continue to pay off in an economical sense, and in prevention of injuries, suffering and misery to our employees. We want them to be safe. We know now that we can prevent accidents by vigorously insisting on safe practices."

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M-S-A FEND-SILICONE CREAM

... New formula utilizes advantages of silicones to protect against irritants

The addition of silicones makes this remarkably effective bland vanishing cream chemically inert, adhesive, and water repellent. It goes on the skin smoothly and easily, and it is free from any "feel." The invisible film is tough, durable. It protects against soaps, detergents, chemical dusts and powders, dilute acids and alkalies. The cream is non-toxic, does not interfere with normal skin gland function, and is buffered to the average pH of the acid mantle of the skin. Available in 3 oz. tubes or 1 lb. jars. Write for details.

also M-S-A FEND BARRIER PROTECTIVE CREAMS AND LOTIONS

Neutral and bland, Fend products are available for a wide variety of irritants. They are easy to apply and remove—will not irritate the most sensitive skin. Write for details.

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Your report proves conclusively that we must do everything we can to protect our workers against future toe injuies.
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Yes, this one toe injury actually cost more than an entire safety shoe program.
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Now Available...Safety Shoes in all Styles with the

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The new improved WINGUARD safety steel toe has been our contribution to the many modern advancements made by safety shoe manufacturers in the development of safety shoes to meet the most hazardous requirements and provide your workers with maximum comfort and wear.

*Shoes stocked in plants.

Safety Box Toe Company

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Fuel Can Be Stored Safely

These methods of storage and handling prevent premature ignition and save industry's fuel for useful fires

ALL FUELS—liquid, gaseous or solid—have one thing in common. They'll burn. And the very quality that makes them useful also makes them hazardous.

Fortunately the hazards can be offset, as indicated by the vast amounts of fuel oil, gas and coal consumed daily without mishap by industry's furnaces and boilers.

The storage of these fuels in large quantities brings hazards which can be offset by these practices.

Fuel Oils

Installation for the storage and handling of fuel oil is hazardous and sometimes underestimated. There is also a reluctance to provide much needed fire extinguishing equipment.

Tank farms have been constructed without regard for regulations pertaining to minimum safe distances from building and property lines, resulting in serious exposures to manufacturing buildings, warehouses, power plants and other structures.

Improper design and maintenance of diking facilities greatly increases the fire threat of bulk oil storage. Inadequate venting has led to structural collapse during periods of rapid temperature drop and high rates of fuel withdrawal. Further, the absence of grounding facilities against damage by lighting invites trouble during electrical storms.

With the trend toward larger boilers, furnaces, and other oil burning equipment, there is greater need for more frequent and thorough maintenance of fuel handling equipment for the prevention of large scale fires due to escaped fuel oil.

Gas

There is also a tendency to underestimate the hazards associated with fuel gases. This is due to the fact that it is normal for gases to be piped to industrial plants, either from private or public gas distribution systems.

In areas where plant personnel have grown up around gas fields, there is often a passive attitude toward the handling of fuel gas.

A violently explosive gas-air mixture is more readily created at normal atmospheric temperature, when a leak occurs, than in the escape of fuel oil under the same conditions. There is a real urgency, therefore, in running down and correcting leaks or other deficiencies in gas distribution piping and equipment quickly. Gas is practically invisible and can become pocketed unnoticed in an area, awaiting only a very weak source of ignition to release its destructive energy. Proper design, choice and maintenance of all fuel gas control and burning equipment is essential.

L-P Gas

Handling of LP-gas normally involves high pressure storage facilities, supplemented by vaporizer equipment, on the premises. This bulk storage of fuel gas, under high pressure in the liquid phase, creates serious problems involving exposure, maintenance, and loss prevention and control when LP-gas escapes.

Since LP-gases are sensitive to temperature changes, the pressure rises sharply with a temperature increase. The importance of maintaining relief valve facilities against the hazard of overpressurizing the confining vessels cannot be overemphasized. Relief valves may open during prolonged exposure to the sun's rays or when tanks are exposed to a fire condition, either external or within the tank farm. These relief valves must close promptly when the internal pressure has restored itself to normal. *(—Turn page)*

RULES FOR FUEL STORAGE

FUEL OIL

1. **Store underground; otherwise, in safely arranged, detached, diked aboveground tanks.**
2. **Protect tanks against fire with equipment, based on size, location, contents.**
3. **Equip tanks with adequate vents, also good lightning ground protection.**

GAS

4. **Provide well-placarded, quickly accessible shut-off valves, outside buildings for use in fire, explosion or other emergency.**
5. **Locate meters, boosters, mixers and similar equipment in well-ventilated areas, avoiding confinement if at all possible.**
6. **Eliminate gas leak quickly as possible.**

COAL

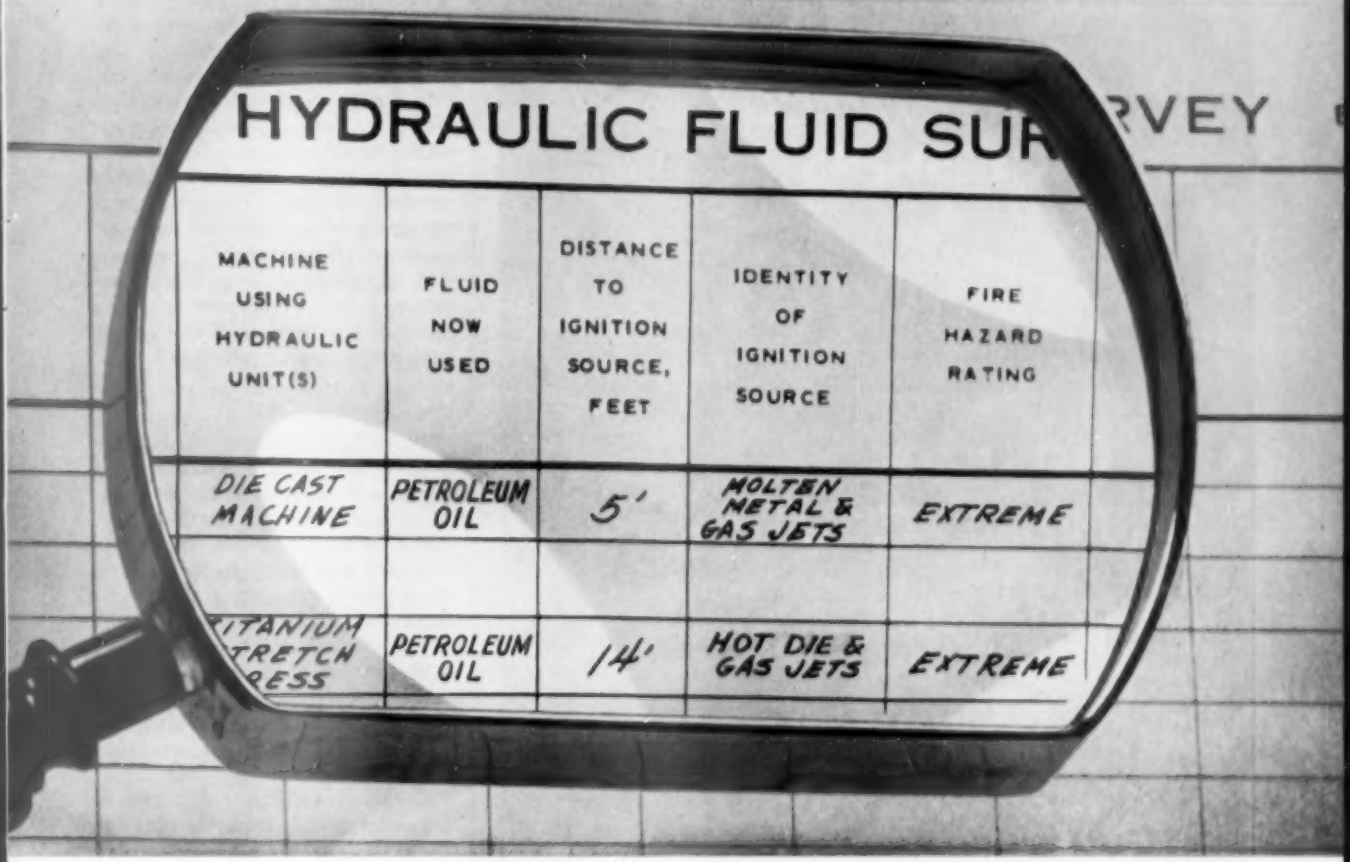
7. **Store coal clear of combustibles and important structures, compacting pile and periodically checking temperatures to prevent spontaneous heating.**

LP-GAS

8. **Engage competent, well-known LP-gas contractors to make tank farms installation.**
9. **Locate tanks and unloading facilities safely clear of buildings, using favorable terrain whenever possible.**
10. **Provide unloading and storage facilities with engineered waterspray protection where conditions require.**

Factory Insurance Association

Face the facts of hydraulic fluid fire dangers in your plant...it may shock you!



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Industries big and not so big are using this easy-to-follow Hydraulic Fluid Survey sheet to make realistic appraisals of the degree of risk they run using flammable hydraulic fluids in the vicinity of an ignition source.

Where costly equipment and personnel are endangered, progressive hydraulics operators switch to fire-resistant Pydraul F-9 . . . the only fire-resistant hydraulic fluid listed by Underwriters' Laboratories.

Ease your mind about hydraulic fluid fire dangers by using the Hydraulic Fluid Survey sheet to measure and rate your risks. Install Pydraul F-9 where it is needed to keep your production moving and firesafe!

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Pydraul F-9 is the first and only hydraulic fluid listed by Underwriters' Lab. From the Lab's service card: "The fire hazard of Pydraul is rated 2 to 3 in accordance with Underwriters' Laboratories, Inc.'s Standard of Classification in which Ether rates 100, Gasoline rates 90-100, Alcohol (ethyl) rates 60-70, Kerosene (100° F. flash) rates 30-40 and Paraffin Oil rates 10-20."

Pydraul: Reg. U. S. Pat. Off.

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EXTINGUISHERS
give you
finger-tip control
for FAST, FLAME-
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Buffalo Dry Chemical Extinguishers with instant, finger-tip control assure faster action against all flammable liquid and electrical fires! You get extra protection too, because a specially designed diffuser spreads a flat, dense blanket of flame-smothering chemical powder in a 60° arc that produces 1100 times its volume on contact with the flames . . . enveloping and extinguishing the flames in seconds! This heat-shielding blanket allows the operator to get closer to the flames for more effective extinguishing.
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BUFFALO
better-built
the right extinguisher for every
fire hazard . . . plus a complete
line of brass goods and hose

Even with greatly expanded LP-gas storage facilities, individual tank farms composed of 30,000-gallon tank units, and limited available space for safe detachment, the highest caliber fire safety engineering is needed to lay out such installations.

Good engineering includes proper design, meeting all jurisdictional codes — suitable location with favorable terrain, fabrication and installation only by reputable vendors, periodic inspection and servicing in a competent manner. It also includes carefully selected fire protection, including fixed water spray equipment and the skillful training of fire fighting and maintenance personnel.

Coal

Solid fuel does not present the degree of hazards inherent to liquid and gaseous fuels, but stubborn spontaneous heating fires occur in coal.

There are basic precautions to be taken in preparing and cleaning an area for coal storage, clearing it of combustible construction and sources of heat, compacting the coal by rolling or dragging in horizontal layers and avoiding the storing of coal which contains more than one per cent sulfur.

Close surveillence of temperature should be kept by suitable thermometer well pipes (sealed at the bottom and capped when not in use). If temperatures exceed 140 F. daily reading should be taken, and should 160 F. be reached, the heating coal should be removed. Coal should never remain in the pile of 175 F.

Pouring water onto a coal pile is seldom effective, and in many cases may be undesirable as it may aggravate the spontaneous heating condition. Actual removal of the burning coal is the quickest and surest method of handling.

Tool Crib

—*From page 58*

should be placed temporarily in a spot reserved for that purpose.

Universal surface gauges are dangerous to handle because of

needle-sharp points—one straight and the other bent—at each end of the scriber. For safe storage, the scriber should be kept in a vertical position, bent-part uppermost and pointed toward the spindle, and clamped closely to the spindle.

Special care, too, should be taken when handling coils of steel spring wire (music wire). It is suggested that each coil be bound in three places with soft wire, and when a length of wire is issued, that it be pulled out foot-by-foot. When cutting the wire, care should be taken that the end does not spring, injuring eyes or fingers.

The preceding are but a few of the precautions that can be observed in the tool crib—the logical place to start—to cut down on accidents, a joint goal of both employer and employee. Here, the equipment needed for the health and safety of the worker can be shown and distributed to him. A well-equipped safety materials section in the tool crib reduces accidents and absenteeism.

Further, so that workers may become more aware of industrial safety equipment normally kept in the tool crib, a display box containing safety messages and slogans may be mounted near the service window. The box can be made of wood, 20-in. wide by 30-in. high by 12-in. deep, with a hinged Plexiglas front to provide visual display of the safety equipment. Some advantages of such a box are:

—Equipment is readily visible.

—This is an effective way to warn, educate and impress on all employees the gospel of safety.

—New and improved safety products are quickly and easily made known in the shop.

—A display box can be kept clean and attractive to the eye, while safety posters and charts—though of great aid in reducing accidents—fade in time and become covered with dust, soil and dirt.

By continually reminding workmen of their duty to observe safety rules, every plant and shop can prevent many time-killing, man-killing and profit-killing accidents.

Tough as they come!

HOOD

Plastic-Coated Gloves

Work gloves just don't come any tougher than HOOD'S Plastic-coated work gloves. They're resistant to acids, alkalies, oils and abrasion. They're flexible and odorless, too, thanks to a special plasticizing process. Curved fingers and winged thumb provide a natural, comfortable fit. Canton flannel lining.

Also available in palm coated style No. PV-94. Write today for 1957 catalog.

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a division of the B. F. Goodrich Company

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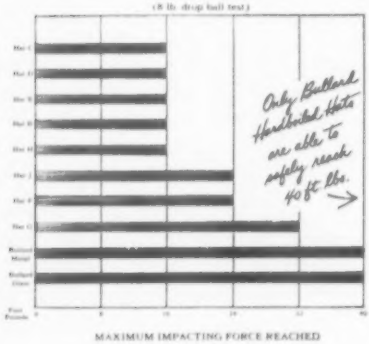
HIS CHANCES MAY BE 33% BETTER THAN YOURS...

You can have all the talk about hard hats being more stylish or light weight or comfortable, because when the chips are down, the only thing that really counts is—will your safety hat get you home safely every night? We can make impressive claims about these and other factors for Bullard "HARD BOILED" Hats, but when you think of Bullard there is one most vital thing we want you to remember... Bullard fiber glass hats are 33% safer! That's right, they've been proven by an independent laboratory, field type tests, to give 33% greater impact protection*... than any of the 10 leading types of safety hats on the market. See this test report. Available from your Bullard salesman or distributor. *Available in fiber glass or aluminum in a wide choice of colors.*

*Based on Report B1-R6, helmet comparative impact performance data.

HELMET COMPARATIVE IMPACT PERFORMANCE DATA
FIELD TYPE TESTS
(8 lb. drop ball test)



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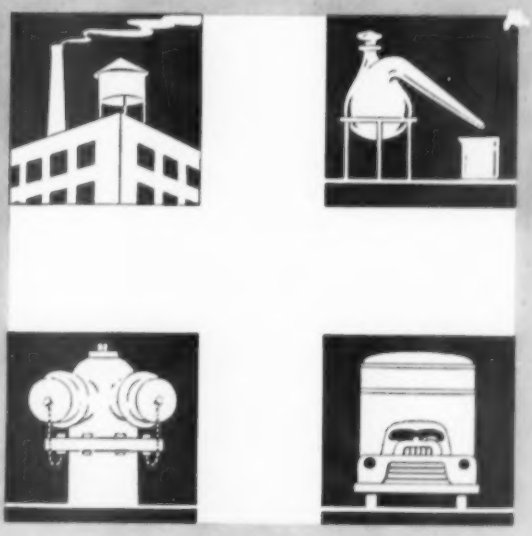
INDUSTRIAL SAFETY EQUIPMENT

TECHNICAL FEATURE SECTION

The Journal

OF THE AMERICAN SOCIETY OF SAFETY ENGINEERS



MAY, 1957

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AMERICAN SOCIETY OF SAFETY ENGINEERS

Organized 1911 — Chartered 1915

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editor, ROBERT E. BEIGHLEY

associate editor, CHARLES S. WOLFF

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JUST A YEAR ago, in response to requests from many Society members, we printed the Creed of the profession on the Journal's inside back cover. This cover page, designed to be suitable for framing, brought compliments and suggestions for an early reprinting. So in this issue, again on the inside back cover, you will find the Creed reproduced. In our next issue we plan to reprint the Code of Ethics for Engineers, which appeared in the Journal last August . . . We believe that this Journal issue contains a particularly varied group of subjects . . . Charles V. Culbertson has written a provocative article on "Does the American Standard Method of Computing Frequency Rates Hide the Truth?" (page 18) . . . Daniel F. Hayes, AEC safety chief, discusses that organization's "Safety and Accident Record to Date" (page 19) . . . In "The Application of Biomechanics to Safety Engineering" authors Theodore F. Hatch and Donald M. Ross show safety engineers a new area for research (page 25) . . . Homer K. Lambie offers a comprehensive paper on "Accident Control through Motivation" (page 29).—The Editor

Our President Speaks on SAFETY

MEMBERS of every profession realize their continuing need to grow in stature and wisdom. This is particularly true in the safety engineering profession. The technological progress within industry during the last 10 years has required that safety engineers, to meet new problems successfully, master an ever increasing body of technical knowledge and gain a keener insight into human behavior.

A number of magazine articles published during the last few years indicates some safety engineers feel that the engineering factor in accident prevention has outlived its usefulness and that we must search for some new approach to those safety problems which still are acute.

This attitude has given rise to a situation described forcefully at the Society's last Annual Meeting in a speech made by Arthur S. Johnson (published in the February, 1957, issue of the Journal). Mr. Johnson said:

"Let me charge one variety of safety engineer with a growing tendency to forget his real objectives. Too many are piddling with contests and accident records quarrels, settling for a safety committee meeting or a routine plant inspection, trying every means at their disposal to reduce the score of accidents except by engineering so that there will not be accidents. *Contribute your proper share of engineering skill to make operations safe or quit claiming to be engineers.*"

Certainly, to meet the complexity of accident prevention in modern industry, a planned program should be established which permits proper emphasis to all phases of accident prevention. Because of the last decade's changes in manufacturing techniques and in the philosophy of handling people, industrial safety engineers have shown a growing tendency to concentrate on some phases of the job and neglect other essentials. However, a well balanced safety program, it seems to me, should give substantial weight to each of the following elements:

1. Organization and administration.
2. Hazard control.
3. Industrial hygiene.
4. Training.
5. Education and promotion.
6. Recording and reporting.

How much of the above program will be engineering? In a number of plants, varied in type, where such a plan has been worked out, approximately 40 per cent of the safety engineer's time is devoted to matters of environmental control such as the elimination of hazards and occupational diseases. This is the basic engineering aspect of the job of accident prevention and the fundamental work of industrial safety.

I believe the philosophy of the profession should be, first, to engineer safety into the equipment and, second, to follow through with training, general education and promotion to insure safe operation.

We cannot afford to overlook either the technical aspects of our new industrial energies and methods or the human factors involved in their use. Of necessity we need men with engineering training or background who can view our modern creations with consideration for the people who use them—safety engineers who can picture *people* in the midst of this mid-Twentieth Century environment.

However, engineering still is the key to industrial accident prevention. The challenge to the profession is to find and develop a sufficient number of men who will be technically qualified to cope with our present day needs, then delve into the relatively untouched fields of human engineering and biomechanics, so that we can make equipment, operations and processes inherently safe.

Henry B. Duffus, President
American Society of Safety Engineers

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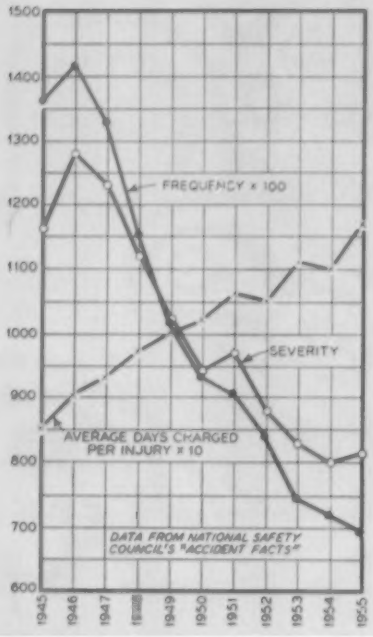
does the American Standard method of computing frequency rates hide the truth?

by Charles V. Culbertson*



***Conflict in Injury Rate Trends:** If injury rate trends in graph (right) show accurate picture, then safety engineers have been directing primary attention to minor hazards, author points out.*

PERHAPS one of the greatest byproducts of the safety movement has been management's increased awareness of its responsibility to the employe and, as a result, a real concern for keeping the employe on the job and his paycheck intact.

However, this emphasis on behalf of the employe has inadvertently robbed the safety profession of the greater part of one of its most useful tools of appraisal, *an accurate frequency rate.* Such a situation has developed, the author believes, because of the wording of one short phrase in the American Standard Method of Recording and Measuring Work Injury Experience, Z16.1-1954.

While 99 per cent of the standard fulfills most admirably the purpose stated in its title, to measure *work injury experience*, National Safety Council statistics seem to indicate that Section 1.2.4 of the standard has nullified this objective.

This section defines a *temporary total disability* (which accounts for a vast majority of the injuries contributing to the disabling injury frequency rate) as "any injury which does not result in death or permanent impairment, but which renders the injured person unable to perform *a regularly established job which is open and available to him* . . . " This last italicized phrase has rendered the balance of the standard ineffective in measuring *work injury experience.*

The practice of providing a so-called "light work" accommodation for an injured worker, making it unnecessary to report a temporary total disability within the Z16.1 definition, conceals the actual incidence of injuries that disable the employe from *his* job.

The disabling injury frequency rate *should* measure the *total number of disabling injuries experienced*, not merely the ones that management could not accommodate with another job. The present definition has enabled a large plant with a variety of jobs to experience an injury and return the man to a job while the small plant across the street, suffering the same injury, must tally it as a disabling injury.

An injury of this type is more than a "minor" injury and the cost—including transfer, accommodation and substitution—certainly is more than that of a "first aid" case. In addition, taking such an injury out of the lost time injury record has removed emphasis in investigation and followup by the safety engineer.

Statistics from NSC's Accident Facts, used in developing the above graph, indicate the present Section 1.2.4 definition should be re-examined. From 1945 to 1955, for organizations reporting to the Council, the disabling injury frequency rate has fallen steadily from 13.6 to 6.96; the severity rate has dropped from 1160 to 815. During the same period the average-days-charged-per-injury figure has climbed steadily from 85 to 117.

The trend flatly contradicts one of the basic obligations of the safety engineer—*to eliminate the serious hazards first.* If this were being accomplished, the average number of days charged per injury should be declining as we eliminate the more serious hazards. Probably the average-days-charged-per-injury trend is rising because more and more of the one, two and three day lost time cases are being "accommodated." But if the statistics were to be accepted at face value, it would seem that we have been eliminating the lesser hazards first.

A simple answer would be to change the definition in this ASA standard to read, " . . . which renders the injured person unable to perform *his regular job.*"

EDITOR'S NOTE: Comments on Mr. Culbertson's provocative article are invited from readers.

**This article has been adapted from an article written by the author, "Does This Standard Hide the Truth?" which appeared in the January, 1957, issue of the Magazine of Standards, published by the American Standards Association.*

RADIATION EXPERIENCE:* *The Atomic Energy Commission has followed a policy of keeping to a minimum the radiation exposures of workers in the installations of its contractors. Usually the exposure is less than those levels believed acceptable on the basis of research or of calculations based on experience with other sources of radiation. Permissible levels for the public are set even lower, generally at one-tenth of industrial levels. Large and continuing programs of research are directed and sponsored by the commission to determine accurately the levels which may be considered harmless from a chemical and radiological standpoint. These studies on radiation dosage and chemical toxicity and the standards derived from them are reported later.*

In practice few workers are exposed even to the allowable limit for radiation. Some accidents have resulted in injury and some workers have undergone technical overexposures. However, average exposure of workers within atomic energy installations is well below the standards established.

The following series of tables lists radiation accidents in atomic energy activities and reports the general exposure records in routine operations of AEC contractors. Accidents are reported beginning in August, 1945. The exposure records for operations start with the period of responsibility of the Atomic Energy Commission in January, 1947.

In 11 years between August 1, 1945, and July 3, 1956, there were 16 radiation accidents in which 69 persons were overexposed to radiation. In eight cases only one person was involved. In another single instance 28 servicemen were overexposed by an unexpected concentration of fallout after a 1954 weapons test. Of the 69 exposed only two died, in 1945 and 1946. Of the remainder 19 suffered skin injury and several exposures were comparatively minor.

*The five tables included with this article outline the radiation exposure experience in the government atomic energy operations from August, 1945, through July, 1956. The first three of these tables, and the above four paragraphs, are taken from the Twenty-First Semiannual Report of the Atomic Energy Commission, published January, 1957, by the U. S. Government Printing Office, Washington, D. C. This Twenty-First Semiannual Report of the AEC contains an extensive section on radiation safety in atomic energy activities.

ATOMIC ENERGY COMMISSION

The Safety and Accident Record to Date

by Daniel F. Hayes

MANY kinds of organizations have been engaged in the work of the Atomic Energy Commission. Broad categories include construction and engineering, production, research and services. In these categories there are general and special building constructors, mines and mills; chemical, machine, machine tool, instrument, aircraft and petroleum manufacturers; boiler makers, shipbuilders, ferrous and non-ferrous metal companies; transportation companies, colleges, research organizations and others.

The term "normal industry" therefore applies to the Atomic Energy Commission contractors in that their work is a cross section of all American industry. Therefore, a comparison of the AEC accident experience with that of conventional industries can be made (although it is only a rough comparison) since we thereby are comparing a conventional industry, the atomic industry so-called, with all conventional industry.

Standing in NSC List

In the sense that the work of the Atomic Energy Commission and its contractors is such a cross section, the National Safety Council data are the best base line from which to measure accident experience. The National Safety Council each year compiles injury rates furnished by its members and publishes them in a list beginning with "communications," the least hazardous, and running through "lumber industry," which is the most hazardous. The Bureau of Labor Statistics also compiles a list which contains perhaps an even broader picture of American industry. The categories are approximately the same as those used by NSC. The accident frequency rates reported by the Bureau of Labor Statistics are generally higher because many more and smaller industries are recorded.

Most of the AEC contractors are members of the National Safety Council or maintain safety programs in compliance with the commission's requirements, which

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TABLE I

Incidents Involving Radiation Overexposures which Resulted in Injury or Death

DATE	LOCATION	INVOLVED NUMBER	EXTENT OF EXPOSURE	NATURE OF INCIDENT
Aug. 21, 1945	Los Alamos	2	1 fatal; 1 other received 32 roentgen (r).*	Inadvertent criticality in experiment.
May 21, 1946	Los Alamos	8	1 fatal; 7 others exposed to descending amounts resulting in hospitalization; all 7 recovered.	Inadvertent criticality in experiment.
May 19, 1948	Pacific	4	Radiation burns to hands.	Failure to handle radioactive air filters properly after collecting by airplane following weapons test.
Sept. 7, 1948	Los Alamos	1	Radiation burn on ankle.	Allowed radioactive material he was unpacking to rest against his leg.
July 9, 1952	Los Alamos	1	Radiation burn on fingers of right hand.	Handling material with torn gloves.
Mar., 1954	Idaho Falls	28	78 r.	Fallout from weapons test; 40 per cent suffered skin lesions.
July 25, 1955	Marshall Islands	1	Radiation burn in external ear.	While welding particle lodged in ear.
Apr. 30, 1956	Los Alamos	1	Slight suspected radiation burn on hand.	Handling radioactive source.

*A unit of measurement of gamma ray and X-ray radiation. A roentgen is that quantity of gamma rays or X-rays that will produce two billion ion pairs in a cubic centimeter of dry air under standard temperature and pressure.

produce relatively good accident experience. The commission injury rates, including accidents involving nuclear radiation, taken as a whole compare very favorably with the best rates in NSC's annual listing. The overall AEC injury frequency rate for several years has been second or third from the top of the NSC list.

But the subject the author has been requested to discuss (by the American Management Association; see note at end of article—Ed.) calls for a comparison of the accident picture in the "atomic energy industry." And so the analysis should be confined to those accidents or costly incidents which are peculiar to the companies which actually have been engaged in some uses of those materials and processes which involve nuclear radiation. A comparison can be made if certain limiting factors are considered.

Limiting Factors in Comparison

Used in Many Kinds of Industry: The first of these factors is, as I have pointed out, that the production and use of atomic energy may occur in many different kinds of "normal industry."

Atomic energy is a natural physical phenomenon. In the Atomic Energy Act of 1954, it is defined thus: "All forms of energy released in the course of nuclear fission or nuclear transformation." For our purposes, let us consider atomic energy, or more properly "nuclear energy," in the defined sense and say that it is a form of energy like electricity or heat energy in steam. It is then something which is used in a large number of different ways in several or many different industries. We can consider it as a cause of accidents, identifiable by its peculiar nature, and deal with it more profitably in comparing the number and nature of accidents arising from its use.

Known for Only Few Years: Another factor in the comparison is the period of time during which the hazard has been existent, requiring the consideration of industrial management. The use of atomic energy has grown to its present proportion more quickly than has the use of electrical, hydraulic, chemical or other basic source of energy. (One might except rocket energy, which in recent years has been developed in many forms.

TABLE II

Other Incidents Involving Radiation Overexposure

DATE	LOCATION	NUMBER INVOLVED	EXTENT OF EXPOSURE	NATURE OF INCIDENT
June 2, 1952	Chicago	4	12, 71, 146 and 189 rep.*	Accidental criticality during control rod test on experimental reactor.
Feb. 16, 1955	Hanford	1	Est. 1½ times permissible body burden of plutonium.	Maintenance of contaminated equipment.
Mar. 1, 1955	Nevada	1	39 r.	Guard entered contaminated area.
May 11, 1955	Hanford	3	Whole body estimate 3.5 rad.*	Handled irradiated metal from a reactor.
Jan. 18, 1956	Nevada	4	28, 14, 4, 19 r.	Overexposure during recovery operations.
June 16, 1956	Savannah River	1	7 rad.	Operator inhaled radioactive gas.
June 18, 1956	Hanford	1	Probable significant body burden of plutonium.	Break in instrument line.
July 24, 1956	Idaho Falls	8	21.5 to 2.5 r.	Placing experiment in materials testing reactor.

*A unit of measure of effects of radiation. The rep and the rad under many conditions are sufficiently close to the dose delivered by one roentgen that, within the accuracy required for radiation protection, the terms may be used interchangeably.

TABLE III

Other Incidents Involving Radiation

DATE	LOCATION	NUMBER INVOLVED	EXTENT OF EXPOSURE	NATURE OF INCIDENT
May 7, 1954	Hanford	4	Slight plutonium body burden.	Explosion in pot of turnings from plutonium machinery.
Dec., 1954	Savannah River	1	Records indicate employe could not have received injurious exposure.	Handling contaminated material. After a hearing before a member of the South Carolina State Compensation Commission, there was a finding that employe had in fact been injured.
Jan. 10, 1955	Idaho Falls	1	Records indicate employe could not have received injurious exposure.	Employe claims radiation sickness. Matter is now before the Idaho State Industrial Accident Board.
June 11, 1955	West Milton, N. Y.	1	1.5 r.	Fire involved radioactive sodium at reactor.
Oct. 31, 1955	Savannah River	1	Records indicate employe could not have received injurious exposure.	Alleged radiation injury. Employe has since died. Case is now before the South Carolina State Compensation Commission.
Jan. 17, 1956	Hanford	1	Plutonium contamination to hands required 50 days to remove all plutonium.	
Jan. 18, 1956	Bridgeport, Conn.	1	Employe took home a piece of string with cobalt source attached.	
Feb. 1, 1956	Oak Ridge	4	Possible 1.5 rep. maximum.	Unanticipated criticality during experiment.
May 14, 1956	Fort Belvoir	15-25	Possible exposure to not more than 6 r.	Cover left off radioactive source.
July 2, 1956	Bayside, N. Y.	4	1 fatal; 3 others required hospitalization.	Thorium explosion. No radiation injury was involved.

But some of the hazards of rockets were known even to the ancient Chinese and most modern propellants are chemical and well known.)

If one starts with the summer of 1940, when it was possible to predict that a self-sustaining chain reaction might be obtained, the period of growth is about 16 years; if one starts with the Atomic Energy Act of 1946, it is a little more than 10 years. Five years is more nearly the period during which it has been used in private industry or our so-called "normal industry," for in that period the actual problems of industrial applications have been seriously considered. In fact many phases of industrial application still are in a tentative stage.

Let us take as our starting point December 2, 1942, when a self-sustaining chain reaction was first produced in a pile at the University of Chicago. From that date to the present simply is not sufficient time to develop a body of accident experience like that which exists in the use of other forms of energy. Many operating, administrative, legal, medical and social aspects have not been clarified in that period of time. The lack of time for experience is reflected in the limitations and caution in the insurance coverages which recently have been provided in the new insurance arrangements available from the insurance pools. Reservations have been made and will continue to be made until more data can be obtained for underwriting purposes. Too, lack of experience is reflected in the relatively small number of court decisions involving negligence and workmen's compensation and actually in the relatively small number of reported injuries.

Uncertain of Injurious Effects: A further limitation for the comparison, also stemming from the lack of experience, is the uncertainty in defining the risks; that is, the injurious effects. A great deal remains to be learned about the effects of radiation on individuals and, equally important, how they will be dealt with in the courts. In the final analysis it is the effect of the hazard on people, on the ability of people to use property, that we are most concerned with when discussing accidents.

In controlling the radiation hazards accompanying the use of nuclear energy, it has been possible to establish working limits for exposure which, incidentally, in the case of other hazards usually either are not available or are not as definitive as those for radiation. These working limits have been developed after most painstaking and careful study by the best minds available. Even after the best judgment has been applied the working limits have safety factors in them and, in general, have been carefully applied wherever atomic energy has been used. The use of atomic energy has been accompanied by pre-evaluation of risks against these standards with consequent control which has been more exacting and, I believe, more effective than is possible where other hazards are involved.

Exposure to hazard can be measured in units. But there still is not enough actual experience in cumulative effects over long periods of time or in numbers of injuries resulting in actual physical manifestations of injury on which to base all-inclusive medical, underwriting or legal conclusions. Because the controls generally have been applied successfully, the injuries to people which have occurred are not frequent or extensive enough to make comparisons of all-embracing significance.

However, this also leaves room for optimism. Therefore, our comparison suffers by reason of the sparsity of data on the results, measured in damage to persons or property, in the use of atomic energy in an industrial world otherwise full of hazards arising from many other sources.

Incidents of Overexposure

With these limitations in mind, attention is invited to Tables I-III which accompany this paper—tabulations of incidents involving radiation overexposures including those which resulted in injury or death. These three tables appear in the Twenty-First Semiannual Report of the AEC to Congress. Also included with this article are two tables (Tables IV and V) which list compensation experience as it has been reported to the Atomic Energy Commission by its contractors.

You will note that the absolute number of radiation accidents with identifiable injury is not large. Perhaps a general observation may be made that the number is very small even in the short period which we have selected. "Injury" is the normal quantity used in defining industrial accidents where people are involved. The term "incident" is used in the tables because it has been possible to measure overexposure which has not necessarily resulted in injury and the tables include those incidents where individuals have been exposed to amounts of radiation above those which have been considered safe. These amounts are sometimes referred to as "administrative levels."

Only Two Fatalities

It will be noted that there have been only two fatalities. These two accidents have been frequently mentioned and the circumstances are well known. To my knowledge they still are the only fatalities which can be associated with energy released in the course of nuclear fission or nuclear transformation in the so-called atomic energy industry.

The bulk of the injuries occurred in research activities where it is reasonable to expect that the changing conditions and the unknowns involved in any research usually are accompanied by more accidents. Another observation cannot escape those who give even the most cursory examination to the tables: in most instances the causes of the radiation accidents have been found to involve human and mechanical causative factors practically identical in type to the causative factors for accidents in which no radioactive consideration was involved.

Principles of Accident Prevention

This suggests that protection has been and can be achieved by the application of well known principles of accident prevention, with the added advantage that for the first time it is possible to measure exposure with

TABLE IV

Paid Compensation Cases

EXTENT OF INJURY	NATURE OF ACCIDENT	INJURED	APPLICABLE LAW	COMPENSATION INDEMNITY	COMPENSATION MEDICAL	EXPENSE
Fatal.	Inadvertent criticality in experiment.	1	New Mexico	$ 150**	$10	$3,060
Fatal.	Inadvertent criticality in experiment.	1	New Mexico	150**	*	——
Exposure to radiation in above accident resulting in hospitalization. All recovered.	Inadvertent criticality in experiment.	1	New Mexico	3,500	*	465
		1	New Mexico	2,000	*	575
		1	New Mexico	500	*	508
		3	New Mexico	——	*	——
Radiation burns to hands.	Failure to properly handle radioactive air filters when removing after collection by airplane.	1	U. S. Longshoremen's and Harbor Workers' Act	——	45	20
		1		1,412	*	——
		1		2,071	*	——
		1		1,808	347	——
Radiation burn on ankle.	Allowed radioactive material he was unpacking to rest against his leg.	1	New Mexico	245	*	10
Radiation burn on fingers.	Handling material with torn gloves.	1	New Mexico	43	*	30
Radiation exposure.	Inadvertent criticality in experiment.	1	Illinois	2,374***	*	350
		1		58	*	——

*Medical service furnished by AEC contractor.
**No dependents—funeral expense only.
***No proven injury—claim settled.

a high degree of accuracy. The best of these principles of accident prevention is the one which affirms that good operations are safe operations; i. e., safety is not a separate entity. The techniques and the costs of atomic operations are new in degree and applicability in view of the added hazard.

Costs of Operation

Added capital costs will be involved in architectural aspects of the building, as in tiled or easily cleaned floors and walls, hoods and ventilating equipment, shielding, separation of areas and, in some cases, additional laundry equipment or buildings, waste handling and disposal equipment.

At present there are additional personnel costs involved in acquisition and training, as well as the necessity for executing the functions imposed directly by radiation control records, instruments, instrument maintenance and accountability. In the higher hazard operations there may be time, personnel, engineering and consultant costs and the cost for research arising from hazards engineering and planning.

As an example of some of the costs which attend the operation of a small plant processing fissionable material, consider the case of an actual plant employing 250 persons.

In a plant of this size which did not handle radioactive materials the safety program, if any, would be effected by a personnel man or superintendent on a part time basis; few plants of such a size employ a full time safety engineer. Frequently, a full or part time nurse is assigned to some of the work. The compensation carrier may supply a limited amount of accident prevention service. Fire prevention also will get some attention through service of the fire insurance carrier.

Additional Plant Personnel

In the plant we are considering, normal and enriched uranium are processed, the final product being, generally, fuel elements for nuclear reactors. This plant has a full time safety engineer. His job requires that he have a good knowledge of radiation and its effects and of the usual procedures for recording exposure and the investigation of situations producing excessive radiation limits. He must have an understanding of ventilation problems, the handling and use of machinery involved, the com-

pensation laws and requirements and a working knowledge of medical procedures. He has a secretary who assists in maintaining exposure records and necessary correspondence.

The procedures were originally set up with the help of consultants. The company employs three consultants for part time service, one on ventilation and two on health physics problems. The services of an industrial toxicologist also are used, but less frequently. These services run about $500 a month. The plant also has a full time nurse and the services of a regular outside physician.

Pre-Evaluation of Plans, Processes

In order to assure good accident prevention, all new plans and processes are pre-evaluated by supervisory personnel, the consultants and the safety engineer before the work is done.

Since criticality problems occasionally arise in the processing of enriched uranium, the plant has one employe whose specialty is the avoidance of criticality in the handling of fissionable material.

Other Requirements

Ventilation runs about 40 per cent of the total capital investment. Ventilating requirements are about 750,000 cubic feet per minute. This results in a larger heating plant and in increased maintenance costs.

Some special firefighting equipment is needed for protection against fires in pyrophoric metals and some additional personal protection is required. Incidentally, the plant enjoys a very low compensation and fire loss.

The problem of accountability, as well as the safe storage of the metal, requires a vault costing in the neighborhood of $10,000 with this setup.

The plant has little difficulty in meeting the hygienic and radiation standards of the Atomic Energy Commission; consequently, it has not had to face a problem which may arise where controls are less careful and overexposure occurs. In such cases it might be necessary to limit the time of exposure of an employe by assignment to other work.

This is as typical a plant as I could find for the cost comparison in fuel element manufacture.

In larger operations the additional personnel required for the radiation and safety is about three per cent. But obviously this will vary with the degree of hazard involved.

Conclusion

I think it is appropriate to conclude with two observations on our comparison. (1) The actual picture of injury experience with a new industrial hazard has been good; from this, we can conclude that the radiation hazard can enter industry as a controllable hazard. (2) While costs for radiation safety may be higher in order to control accidents and injuries, these costs should be considered part of the operating expense.

EDITOR'S NOTE: The above article has been adapted from an address made by the author at a special conference of the American Management Association on the subject, "Managing the Atom," which was held in New York City February 7-8.

TABLE V

Pending Compensation Cases

EXPOSURE AND NATURE OF ACCIDENT	APPLICABLE LAW	INDIVIDUALS INVOLVED
Alleged radiation injury from handling contaminated materials. Exposure records indicate claimant could not have received any injurious exposure. After a hearing before a single member of the South Carolina State Compensation Commission, there was a finding that claimant had in fact been injured but could not recover due to the statute of limitations. He has not appealed to the full commission and AEC cannot.	South Carolina	1
Claims radiation sickness. Exposure records indicate he could not have received any injurious radiation exposure. The matter is now before the Idaho State Industrial Accident Board.	Idaho	1
Alleged radiation injury. Claimant has since died. Exposure records indicate he could not have received an injurious exposure. The case is now before the South Carolina State Compensation Commission.	South Carolina	1

THE APPLICATION OF BIOMECHANICS TO SAFETY ENGINEERING

by Donald M. Ross and Theodore F. Hatch

Know Man's Physical Limitations, Eliminate Excessive Stress, Reduce Accidents; Report Based on Material Presented by Authors at National Safety Congress

IN any particular work situation one of the factors which may influence the accident potential is the lack of a proper functional relationship between the man and his job, wherein the operator is subjected to stresses which increase the likelihood of his having an accident. One area in which such inadequate functional relationship may be of particular importance is concerned with the demands imposed upon the man to apply mechanical force. Thus, if the amount of force which he has to apply exceeds his mechanical capacity and especially if he must assume an awkward position when he is applying force, the accident potential is increased.

Human capabilities and limitations in the application of mechanical forces come within the field of biomechanics. In this paper the term is considered with particular reference to the development of design specifications which tend to ensure maximum safety for the operators of industrial machinery. The groundwork is laid for the alleviation of some stressful job conditions by systematic biomechanical analysis of certain work activities.

Two Human Factors Affect Safety

In any consideration of the role of the human factor in accident causation, we must recognize two distinctly different ways in which the characteristics of human behavior enter into the problem.

Unsafe Acts: In the first case the performance of "unsafe acts" is superimposed on a work situation so as to increase the accident potential over that of the job itself. Common examples in this category include standing under a crane, operating a saw with guard removed or willful removal of a respirator during a dusty operation. These are instances of overt human behavior which act as independent factors in accident causation.

Effective counteraction includes both the provision of mechanical safeguards which protect the worker despite his own actions and the actual improvement of human behavior by means of such preventive activities as employe selection, placement and training.

Excessive Stresses: In the second case the human factor adds directly to the accident potential of the job itself because the work imposes excessive stresses upon the worker. These cause a failure in the safe functioning of the man-machine system and the accident probability goes up without, necessarily, the imposition of "unsafe acts." Thus, for example, the increased accident potential on "hot jobs" may be the consequence of too much heat stress. The performance of a job may impose demands upon seeing which are in excess of visual capacities; environmental noise may be an irritation factor; vibration may interfere with visual acuity; an operator may be forced to assume an awkward position in order to perform a particular task. All of these represent situations wherein the inherent accident potential of the job is increased because the stresses imposed upon the operator are in excess of his capacity to deal with them safely.

Such added risks cannot be completely offset through attempt to improve human behavior. Rather, minimizing the accident risk in such stressful man-machine situations involves a revision in the design of the work situation based upon a fundamental understanding of man's capabilities and limitations to deal with external stresses.

This paper is concerned with one of the elementary requirements in the design of machines for safe human usage; namely, the establishment of optimum machine

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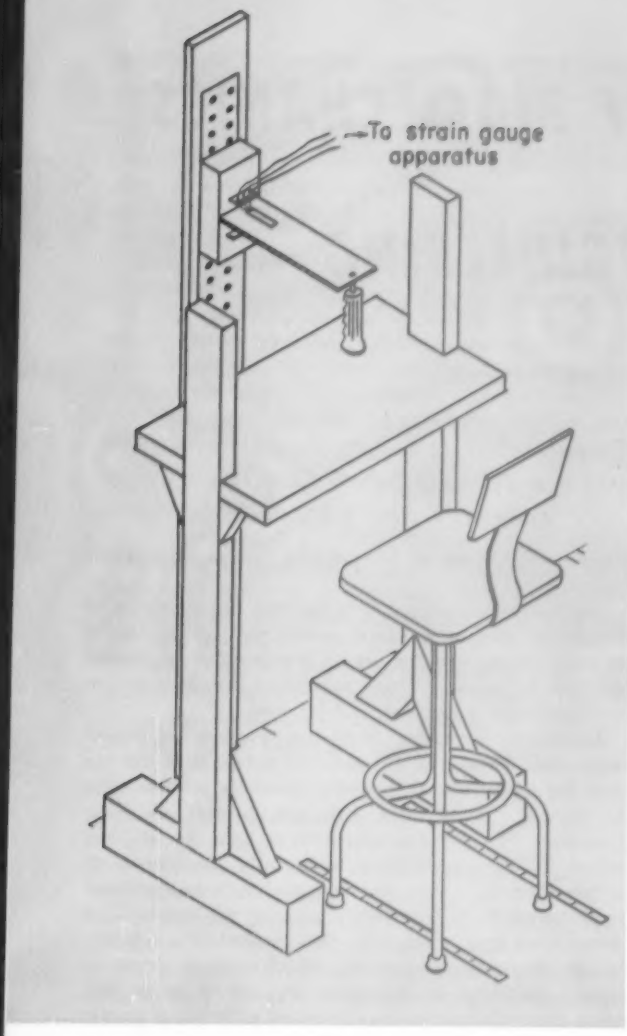


Figure 1—Experimental apparatus.

dimensions to agree with the biomechanical characteristics and capacities of man.

The safety implications of mis-matching machine dimensions with man's biomechanical capabilities are not sharply drawn in the sense that they have been demonstrated in designed and controlled experiments. Rather, they emerge from rational consideration. It is obvious that, if a worker must continually reach beyond his range of vision, sooner or later he will sustain a hand or finger injury; if the job requires the application of force in an awkward position, the probability of a fall or a back injury is increased; if inadequate head room is provided, head injury is inevitable.

Need New Data on Man's Abilities

Even though the engineer may anticipate such consequences of inadequate design, he rarely is supplied with the quantitative data necessary to meet safety requirements. It follows that, since a knowledge of man's biomechanical characteristics is important to the design of a safe work place, a systematic description of these characteristics is needed.

Efforts to describe the dimensional relationships between a man and his job have been confined principally to the following areas: (1) anthropometric surveys of man's linear dimensions, (2) measurement of the limits of movement of bones and muscles in assessing joint pathology and (3) measurement of working area boundaries.

Although some useful data have been obtained from each of these sources, all three have yielded only static, linear dimensions and do not give a clue to the solution of problems where, for example, strength and endurance are important factors, since the magnitude of these factors depends upon the position of body during the application of force. In view of this limitation it has been suggested that biomechanical data should be collected in terms of man's functional dimensions—defined here as a human capability related to the performance of a task at some distance and direction from the worker.

The difference between a static and a functional dimension can be shown by example. The limit of a man's reach may be known from standard anthropometric measurements but this information does not provide the design engineer with answers to such questions as "What can the person accomplish when his arm is more or less extended? How much torque can he exert? How much pushing or pulling? How much vertical downward or upward force can he exert?" Such measures of useful work have been given the name of "functional dimensions."

It is suggested that the evaluation of such functional dimension may provide the engineer with needed data which he can apply more readily to the design of machines. Furthermore, work, when broken down into its force components, is a concept which an engineer accepts as being within his own area of basic knowledge.

Conduct Experiment at Pitt

Two examples of this approach to the study of biomechanics have recently appeared in the literature. The first of these experiments, conducted in our own laboratories at the University of Pittsburgh Graduate School of Public Health, sought to answer these questions: "How does the ability to exert a vertical downward force vary as the three dimensions of the task are changed? Can these relationships be explained in terms of the biomechanics of the arm?"

Following is a brief review of this experimental work:

A miniature work situation which simulated a common industrial task, represented schematically in Figure 1, was set up in the laboratory. The subject, seated with his back supported by the backrest, grasped the handle and exerted a maximum vertical downward force which was measured by a pair of strain gauges. The horizontal distance from the subject to the task was varied systematically from a minimum to a maximum reach position and the vertical dimension similarly varied in equal increments above and below the shoulder level.

The several thousand measurements made with the apparatus provide a basis for the three dimensional graph shown in Figure 2. Note these two characteristics of the relationship shown here:

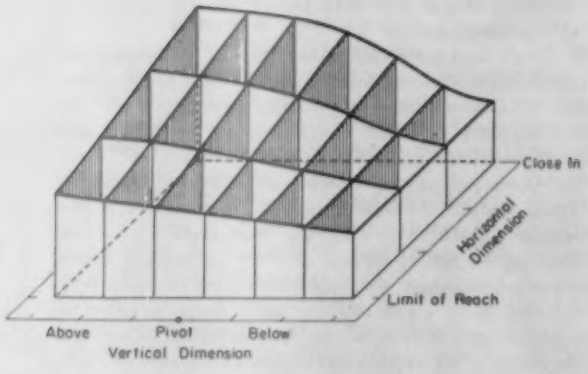


Figure 2—Variation in maximum downward force with changes in vertical and horizontal task dimension.

1. At any given vertical dimension, the force which can be exerted decreases in an approximately linear fashion as the horizontal distance to the task is increased.
2. At any particular horizontal dimension, the force decrement with change in vertical position tends to be curvilinear, although this tendency is less pronounced as the maximum reach is approached.

The systematic nature of these force-position characteristics strongly suggests that the relationships can be explained in terms of the mechanics of the muscle and level systems involved.

By considering the muscles and bones of the shoulder and arm as the balance lever system shown in Figure 3, it is possible to apply the principles of mechanics to the study of this particular exertion. This analysis yielded this expression for the relationship between maximum force and the task position:

$$F_v = K\frac{a}{x}\sin\left[\cot^{-1}\left(\frac{\frac{a}{b}-\cos\alpha}{\sin\alpha}\right)\right]\cos\phi \left(\sin\frac{\alpha}{2}\right)^{\frac{3}{2}}\cdot\left(\sin\frac{180-\beta}{2}\right)^{\frac{3}{2}}$$

where:

- F_v — vertical component of the force exerted.
- K — constant, the value of which varies with the physical characteristics of the individual.
- a — distance from shoulder pivot point to point of effective origin (attachment to the more fixed part of the skeleton) of the muscle.
- x — effective lever length.
- b — distance from shoulder pivot point to point of insertion (attachment to more movable part of skeleton) of the muscle.
- α — angle between body and upper arm.
- ϕ — angle between exerted force and vertical component of same.
- β — elbow angle.

Figure 3—Schematic representation of the shoulder-arm lever system.

This rather imposing equation is an elaboration of the simple lever formula. It contains three parts:

1. The first:

$$K\frac{a}{x}\sin\left[\cot^{-1}\left(\frac{\frac{a}{b}-\cos\alpha}{\sin\alpha}\right)\right]\cos\phi$$

is an expression for the change in mechanical advantage of the lever system as the task position is changed.

2. The second factor:

$$\left(\sin\frac{\alpha}{2}\right)^{\frac{3}{2}}$$

has as its basis the fact that the tension which is developed by a muscle is related to the degree of contraction and, hence, to the relative length of the muscle.

3. The third part:

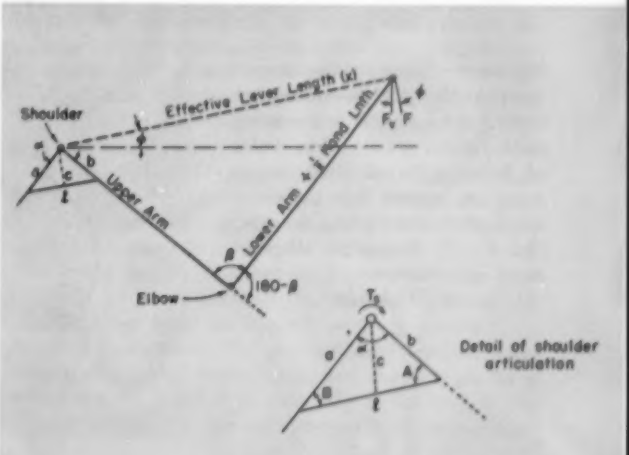
$$\sin\left(\frac{180-\beta}{2}\right)^{\frac{3}{2}}$$

gives recognition to the fact that the exertion of force, F_v, is dependent upon the stability of the elbow joint and is proportional to the degree of contraction of the triceps muscle.

This mathematical model does, in fact, explain the major relationships shown in Figure 2 and, within certain limits, can predict those task positions at which an individual can perform this task to best advantage.

University of Michigan Makes Study

A second biomechanical analysis was recently completed by the Department of Anatomy at the University of Michigan under the direction of Dr. W. T. Dempster.



This research was undertaken to describe the mechanical factors which are operative when the body exerts a pushing or pulling force with the hands. The approach of these investigators to the solution of this biomechanical problem revealed two basic mechanisms of force production: (1) hand pushes or pulls may be exerted as direct compressive forces spanning the hand grip and the backrest and (2) push and pull forces involve the action of force couples. Body dead weight, when applied at different points, creates variable leverages and appreciable torque values.

Analysis of the results of measurements on human subjects clearly demonstrated the direct relationship between the magnitude of exerted force and the calculated value of moments of force of the body weight couple. The resulting mathematical models accurately predicted the relative ability to exert a pulling force when the body was in six different positions shown in Figure 4. The basic concepts developed by this methodology were not altered by the addition of a footrest or by the use of a backrest.

Data Apply to Safety Engineering

The foregoing studies are fundamental in nature but the following implications for safety engineers are clear:

1. They illustrate how the need can be met for the systematic analysis of man-machine relationships which will provide a basis for establishing safety design criteria. Past experience indicates that such analysis must precede the actual design of machinery. A case in point is the design of prosthetic devices after World War II. Consultation with orthopedists and physical therapists disclosed the fact that no adequate understanding of knee action existed and a thorough biomechanical analysis of the knee was necessary before the design of artificial legs could begin.

2. Given such systematic description of biomechanical characteristics, a sound basis is provided for the accumulation of data on large population groups. When the safety engineer is asked such questions as "What are the optimum load limits for lifting; for carrying?" and "How much pull can be exerted on a lever?" he needs to know the distribution of these characteristics in the industrial population. With an understanding of the mechanism of force exertion and the underlying force-distance relationship, it should be possible to make relatively few force measurements on a large number of individuals and thereby arrive at a practical knowledge of the range of the mechanical capabilities of man at work.

3. By relating force output to body and task position, these studies in themselves suggest design and layout criteria for safe operation. For example, it follows rationally that a task located in such a position as to require only a small fraction of a worker's maximum force output will have a lower inherent accident potential than the same task so positioned as to necessitate a nearly maximum exertion.

This suggested approach to the study of biomechanics supports to aid in the solution of a problem which in itself is not fully understood. That is to say, present day safety statistics give no clue to the magnitude of the accident hazard caused by inadequate consideration of biochemical forces in relation to task position. At the same time, new approaches in accident investigation and analysis are needed which will bring out more sharply those situations in which improper functional dimensional relationships between a man and his job contribute to the accident hazard. Early studies in biomechanics should aid in developing the approach to this phase of accident investigation and the findings from such investigations will, in turn, indicate the need for further studies in biomechanics.

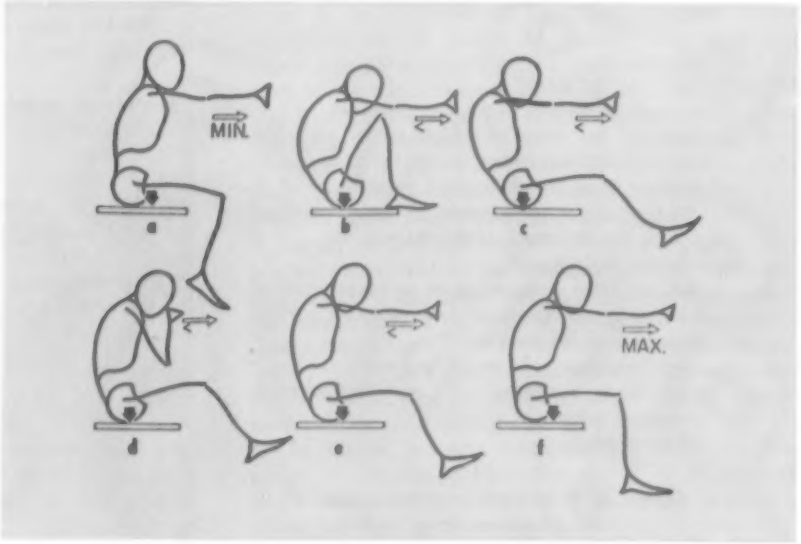


Figure 4—Stick figures representing the six positions assumed by subject in exerting push forces, arranged in order of force effected from minimum at upper left to maximum at lower right (courtesy Dr. W. T. Dempster, Department of Anatomy, University of Michigan).

by Homer K. Lambie

Accident Control through MOTIVATION

ONE OF our foremen recently cautioned a maintenance mechanic against using a rag to wipe the running gears of a machine. He warned the mechanic that it was a dangerous practice and told him that he should not do it again. Five minutes later the same employe lost four fingers of his right hand when the rag with which he was cleaning became entangled and drew his hand into the gear mesh.

When the employe was asked why he did this, he said, "I forgot. I didn't know what I was doing." *What motivated this employe to do exactly what his foreman specifically had told him not to do?*

In another case an employe was involved in 24 accidents in six months. His foreman called him in for a discussion of his unsatisfactory accident record. Following this, the employe was not involved in an accident for a year and a half, during which time his record was carefully checked. *What motivated this employe to safety?*

As is suggested by these examples, accidents can be created as well as prevented through motivation. What is "motivation?" According to *Webster* it means "any motion which prompts one into action." I would rather give it the definition that a friend of mine suggested: "To get someone to want to want to."

People often react adversely to a suggestion, due to any number of psychological reasons. The first example of the man who lost his fingers wiping the gears of a running machine and many other similar accident cases indicate that in order to control accidents through motivation it is important for us to consider carefully:

1. *When* motivation is most effective.
2. *What* motivates people.
3. *How* to get people "to want to want to."

Preliminaries to Safety Motivation

Before we talk about *when* to motivate people, perhaps we should consider certain conditions which, whenever they exist, will seriously hinder the success of any efforts to motivate people for safety. Such conditions—most important of which are physical inability to perform assigned tasks safely, lack of required knowledge or skill and lack of clear understanding of instructions—usually are correctible. Certainly before attempts are made to control accidents through motivation, any such obstacles should be removed.

Physical Inability: We should not attempt to motivate people to safety until *we have investigated and are satisfied that they are physically capable* of doing what we ask.

Illustrating the vital role physical inability can play in accidents is the case of a teacher who had a record of 14 traffic accidents during a five-year period; he continued to have these accidents despite his intense interest in safety.

Through a thorough analysis of his accidents it was finally discovered that he had a visual problem which was responsible for his poor traffic accident record. He could not avoid driving into objects and other cars no matter how well he was motivated. Motivation could not improve his vision.

Lack of Knowledge: We should not attempt to motivate people until *we have made sure that they possess the knowledge or skills required* to avoid hazards.

For example, a driver of a truck had 42 accidents in 19 months, most of them during the evening hours. When this driver was brought in for a discussion of his record, it was discovered that he usually worked nights and while doing so wore dark glasses to avoid the effects of headlight glare in night driving. He was wearing the glasses for comfort only.

This employe did not realize that dark glasses prevented him from seeing all of the cars, objects, animals and people involved in his 42 accidents. He had neither the knowledge nor ability to recognize that his dark glasses were the primary cause of his accidents. No matter how safety conscious he might be, no matter how frustrated by his accidents, he could not prevent the accidents until someone pointed out to him the relationship of the dark glasses to his misfortunes. Once he stopped wearing the glasses he stopped having accidents.

In this case it was not motivation but knowledge that was the needed factor.

Here is another example when lack of knowledge, rather than motivation, was responsible for an accident:

An electrician was using benzol as a solvent for cutting shellac. He worked in a confined space most of the day cleaning motors. By the end of the day the man was desperately ill and permanently injured. Neither he nor his foreman knew the hazards of using benzol.

Another example is the gas station attendant who, having used carbon tetrachloride for many years as a cleaning solvent, used it to clean the upholstery in his car. A short time later he drove the car with the windows

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Assembly of employes for safety awards presentation gives winners earned recognition, an important factor in controlling accidents through motivation.

closed before the upholstery was completely dry. Within two days he died as a result of exposure to the carbon tetrachloride fumes. He did not recognize the danger involved in this exposure. Hundreds of similar cases have been reported throughout the country. Knowledge of the hazards, rather than motivation, is needed to prevent this type of accident.

Misunderstanding of Instructions: *Motivation will not prevent accidents when clear understanding of safety is lacking.*

For instance, a group of employes were instructed to do housekeeping cleanup in the shop area. At the same time they were cautioned not to get "too close" to moving machinery. A short time after the instructions were given, one of the employes climbed behind the barrier and started cleaning near a moving shaft. He was involved in a near fatal accident.

When he was questioned as to why he had climbed over the guard to clean, he answered, "The boss asked me to clean up and that is what I was doing. I thought I could do it without getting too close to the shaft but I guess it didn't turn out that way." Apparently this employe, in his anxiety to clean well, misunderstood his foreman's caution—it was a matter of interpretation as to "how close is too close."

These examples indicate that motivating employes to work safely is practical only when they know the hazards and how to avoid them and are physically and mentally capable of keeping themselves safe on the job.

When Motivation Is Effective

Specifically, attempts to achieve accident control through motivating employes for safety will be most successful when the guide posts listed below are followed in such a program. Motivation is most effective:

1. When objectives of the safety program are clear and definite. For example, we would like the employes to use the bridge instead of jumping over the conveyor. We would like the employes to take better care of the ladders by putting them in their proper places after use.

2. When the objectives are within the capabilities of the employes. Make your requests reasonable. For example, don't ask the men to clean up 10 years of neglect in three days when obviously it will take 30 days just to get started.

3. When objectives are simple. For example, don't start all at once to request active participation in housekeeping programs, management safety committees and union safety committee programs and expect enthusiastic response. Such an abrupt procedure probably will get nowhere. The employes won't know where to start so they won't do anything. It is better at first to take up one simple project at a time. Perhaps a good beginning would be a very simple housekeeping program in one section of the plant and a very simple award system.

4. When the objectives provide challenge to the individuals concerned. We should not say, "Let's clean up the department for the next 30 days," when they have been doing it every day for the last two years. This presents no challenge; no skill is required, no special effort or action. Rather, suggest, "Let's *improve* the housekeeping in Department 12 by doing A..... B...."

5. When the objectives are short range. We should set a goal to improve the safety record in the near future, rather than to achieve an ideal record five years from now. The group will be more interested in seeing the progress of their efforts within the next 30 days or perhaps the next six months.

What Motivates People

Now let us consider what motivates people. Why do they act the way they do? It is generally agreed that people act in certain ways to satisfy their basic drives or desires which, for the purpose of this discussion, we can classify into four groups:

1. Desire for *acceptance.*
2. Desire for *recognition.*
3. Desire for a *challenge.*
4. Desire for *security and comfort.*

Acceptance: Most people like to be accepted. If by working safely a man gains acceptance of his supervisors, his fellow employes and his union, he is likely to *want* to work safely. (As has been pointed out previously, however, he also must know how to work safely.)

In one plant which has many similar operations and departments, one unit operated for more than three years without a lost time injury to any of its members. This was a far better record than that of any of the other units in the plant.

When the supervisor of this group was asked to explain how he was able to accomplish this fine record, he answered, "I pray for my men; they are my friends." It was his way of saying that he accepted his men unconditionally and that in turn for this acceptance the men worked safely and efficiently. (Probably neither the foreman nor the men could explain their reactions consciously.)

National industrial surveys have found that generally an employe values the acceptance of his supervisor as one of the most important parts of his job. For *acceptance* a man will put forth more effort to work safely.

Recognition: Most people like to be recognized. This desire for recognition is so strong in some people that they have been known to try to attract attention at the risk of serious injury to themselves.

But also we have many examples of groups of employes in hazardous jobs who work year after year without a lost time injury, motivated by the goal of winning recognition in the form of an annual safety award. The interest in safety aroused by such awards has proved to be a very important factor in controlling accidents.

However, to be successful a safety award must satisfy the workers' desire for *earned* recognition. Empty flattery is not an effective substitute and will not be appreciated. It is also important to point out that recognition may be harmful if it sets an individual above or apart from his group, which will limit the amount of acceptance he receives from his fellow workers. Motivation for safety is greatest when the desires for acceptance and recognition are satisfied through the same program.

Challenge: Most people like a reasonable challenge. It provides ego satisfaction through accomplishment. For example, let us suppose that a boy running to the store can make the trip in nine minutes; if he is challenged to make it in eight and three-fourths minutes, his normal reaction will be to attempt to make it in eight and a half minutes.

However, a word of caution seems necessary in the providing of a challenge. If the challenge requires more than a reasonable effort on the boy's part, he will not attempt it at all; that is, if you ask the boy to make the trip in five minutes instead of nine, he may feel so certain of failure that, in defiance, he will take 15 minutes to make the trip or will refuse to make it at all.

The desire for challenge is a motivation made especially strong by the fact that usually successful accomplishment brings with it the added satisfactions of acceptance and recognition.

Security and Comfort: Most people like security and comfort. They want to be assured of having adequate food, shelter, clothing and physical comforts. (Physical comforts include such advantages, for employes, as increased rest and reduced effort.)

It is easy to see how actively we respond to reasonable requests in order to gain approval and security. Most of us do not realize how much we actually will do to satisfy our desire for comfort. To save ourselves a little effort we sometimes even will take dangerous shortcuts.

Our inclination to save ourselves effort applies even in the reading of a safety bulletin or pamphlet. For example, a certain new safety pamphlet was sent to a

Housekeeping programs to reduce plant hazards can motivate workers by providing a challenge and opportunity for acceptance and recognition.

Employe meetings build interest in safety, give workers chance to contribute ideas.

ACCIDENT CONTROL MOTIVATION *Continued*

number of people in mimeographed form. Very few read it. Many of those who did were not impressed with it. But the same material, printed in two colors and humorously illustrated, later was distributed and produced very favorable reactions. It served its purpose more effectively than the mimeographed text because it was easier and more pleasant to read.

Employes will do more to make the safety program a success if the program helps them earn some security and comfort. People want acceptance, recognition, challenge and security and will work safely to earn them.

How To Get People "To Want To Want To"

As a basic step in a program of accident control through motivation, the supervisor must indicate sincere acceptance and recognition of the accident free employes, both individually and collectively. By his attitude the supervisor can help employes associate a worker's "no accident" record with the desirable qualities of strength, masculinity, courage, know-how and skill, thereby counteracting the too usual association of these qualities with the taking of chances (which sometimes even includes risks involving the safety of others).

Of course it is necessary also to establish definite safety promotional plans such as:

1. Safety award plans.
2. Contests (limited).
3. Housekeeping programs.
4. Safety suggestion systems.
5. Safety committees, etc.

Each of these programs must be planned so that every employe feels he has an active part in it and stands to gain personally from its success.

For safety award plans the program should be designed to provide recognition for planning, effort and/or accomplishment. One company has had considerable success in providing safety awards for:

1. The best safety program to control hazards.
2. The most improved hazards control program.
3. Achievement in accident prevention (an award presented to an individual or group for outstanding contribution to the prevention of accidents). As many as five of these awards may be presented each year.

These awards provide recognition for those who make "sufficient effort" as well as those who accomplish a good record.

Contests have motivation value only when properly planned. They must provide *earned* recognition. A few general principles to follow are:

1. The contestants should have equal ability to compete. Too often contests are so planned that the most capable, most intelligent employes win all the prizes. The others, lagging, just give up.
2. Contests should be planned so that participants, in trying to win, actually are making a contribution to the improvement of the plant safety record.
3. Contest must be planned so that the winners do not lose group acceptance and the losers do not feel a complete letdown when the contest closes.
4. Contests should recognize the results of effort rather than results by chance.

A housekeeping program is still another device which can be used in motivating people to control hazards. The most successful programs provide each employe with personal challenge and responsibility and equal recognition for effort and accomplishment.

Conclusion

There are any number of daily programs and work activities which may be used to motivate the employe to control accidents. The motivation will be most effective:

1. When these programs assist those involved in accidents to prevent recurrence.
2. When they do the most to build up those who make an effort to avoid accidents.
3. When they establish a "safety mindedness climate" in the plant so that accidents are not associated with daring heroism and martyrdom but, rather, a good safety record is accepted as an indication of ability, strength and effort.

In other words, when these programs provide satisfaction of the employes' basic human desires—acceptance, recognition, challenge, security and comfort—then each employe will *want to want to* control accidents.

Safety committees are recognition of vital role of workers in plant accident control.

AMERICAN SOCIETY OF SAFETY ENGINEERS

The Creed

I am a Safety Engineer. In my profession I take deep pride, but without vainglory; to it I owe solemn obligations that I am eager to fulfill.

As a Safety Engineer, I will participate in none but honest enterprise. To him that has engaged my services as employer or client, I will give the utmost of performance and fidelity.

When needed, my skill and knowledge shall be given without reservation for the public good. From special capacity springs the obligation to use it well in the service of humanity, and I accept the challenge that this implies.

Jealous of the high repute of my calling, I will strive to protect the interests and the good name of any Safety Engineer that I know to be deserving; but I will not shrink, should duty dictate, from disclosing the truth regarding anyone that, by unscrupulous act, has shown himself unworthy of the profession.

Since the Age of Stone, human progress has been conditioned by the genius of my professional forbears. By them have been rendered usable to mankind Nature's vast resources of material and energy. By them have been vitalized and turned to practical account the principles of science and the revelations of technology. Except for this heritage of accumulated experience, my efforts would be feeble.

I dedicate myself to the instruction of younger members of my profession in all its arts and traditions. To my Fellows, I pledge, in the same full measure I ask of them, integrity and fair dealing, tolerance and respect, and devotion to the standards and the dignity of our profession; with the consciousness, always, that our special expertness carries with it the obligation to serve humanity with complete sincerity.

AMERICAN SOCIETY OF SAFETY ENGINEERS

Membership Information

THE American Society of Safety Engineers has established the following classifications of active membership:

MEMBER—To be eligible as a Member an applicant shall be at least thirty years of age and shall be engaged in safety engineering. In addition, he shall have either an engineering or science degree in an accredited college curriculum and the equivalent of eight full years' experience in safety engineering; or he shall have had the equivalent of ten full years' experience in safety engineering.

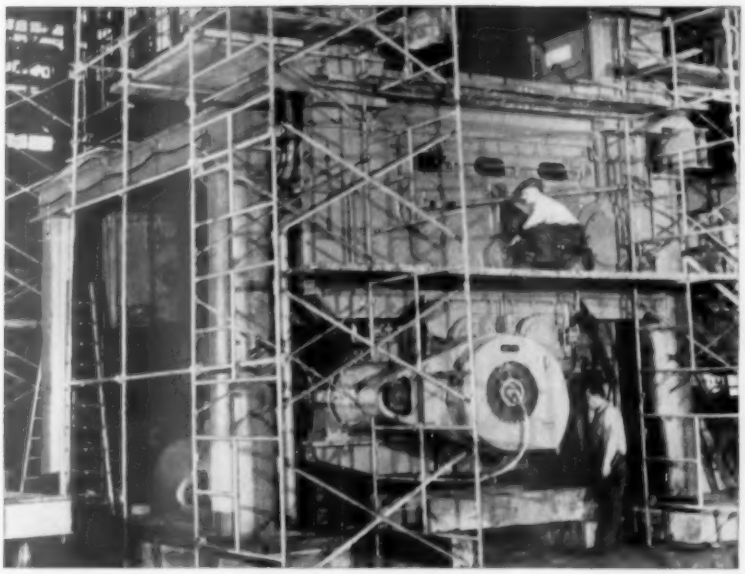
ASSOCIATE MEMBER—To be eligible as an Associate Member an applicant shall be at least twenty-five years of age and shall be engaged in safety engineering. In addition, he shall have either an engineering or science degree in an accredited college curriculum and the equivalent of three full years' experience in safety engineering; or he shall have the equivalent of five full years' experience in safety engineering; or he shall have either an engineering or science degree in an accredited college curriculum, ten years' experience in professional engineering work and one full year's experience in safety engineering; or he shall have twenty years' experience in engineering work, of which at least ten have been at the professional level, and one full year's experience in safety engineering.

JUNIOR MEMBER—To be eligible as a Junior Member an applicant shall be at least twenty years of age and shall be engaged in safety engineering work, which if pursued the required time will tend to qualify the applicant for the grade of Associate Member. In addition, he shall have either an engineering or science degree in an accredited college curriculum or he shall have had the equivalent of one full year's experience in safety engineering.

AFFILIATE MEMBER—The Society also provides a special classification, that of Affiliate Member, for those not professionally engaged in safety engineering. To be eligible as an Affiliate Member an applicant shall be at least twenty-five years of age and shall have contributed to the advancement of safety engineering through demonstrated achievement in some related field of interest in which he has been engaged for at least three years.

for additional information write to

The American Society of Safety Engineers
425 North Michigan Avenue
Chicago 11, Illinois
(or contact your local chapter)



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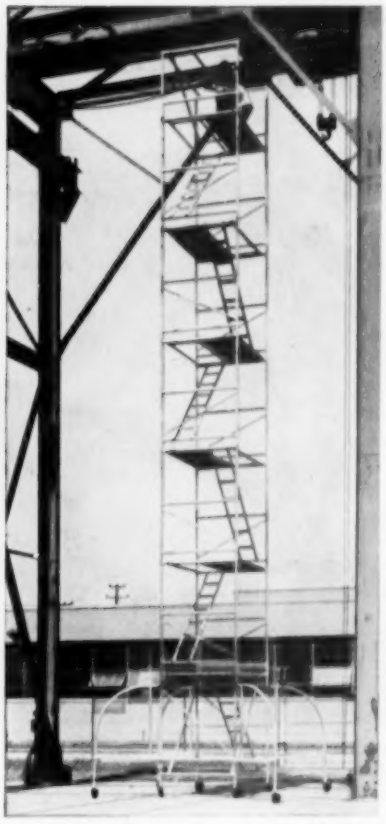

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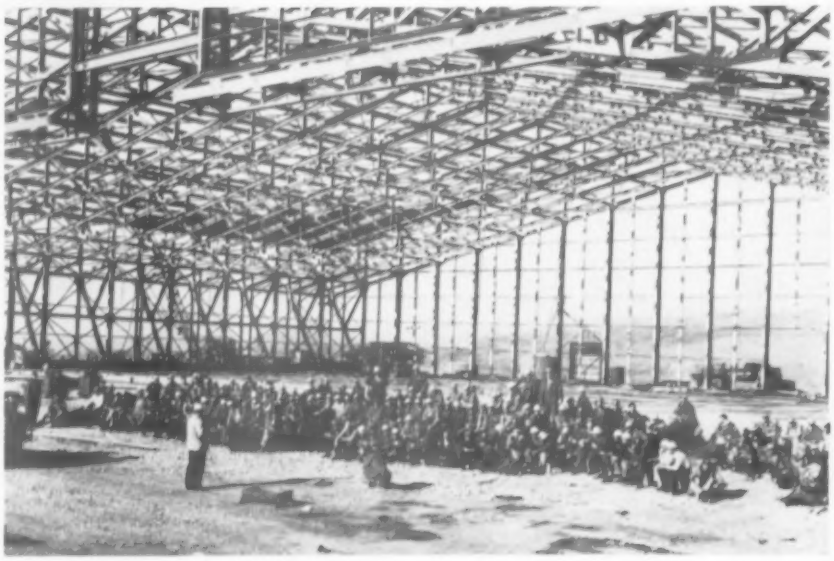
MESS HALL WALL displays one of the many "farthest-north" NSC posters used at Thule Air Force Base.

Deep in the Arctic Circle

By MORA A. FOREMAN

In tropical heat and polar cold, the U. S. Engineers have established accident rates that would be creditable to construction jobs in more favored climates. Here are some interesting reminiscences of a veteran safety engineer with the Corps



SAFETY MEETING at Thule Air Force Base, Greenland, is held beneath steel framework of one of the big hangars. Despite the most adverse climatic conditions, work at Thule, less than 900 miles from the North Pole, was substantially finished with an accident frequency rate 75 per cent better than the national construction average.

AFTER 20 years of safety work, surprises come in every day. But before relating the shocking one for today, which would lead to the conclusion that there has been little improvement in the accident experience, a little reminiscing might be worth while.

It is a far cry from the time when safety was regarded as just a part-time job to winning National Safety Council awards, Department of the Army accolades, and special awards from Associated General Contractors of America, Inc., and to Liberty Mutual Insurance Company paying back nearly a million dollars in returned credits.

Twenty years ago, when I started to work in safety construction for a Corps of Engineers District, the frequency rate was about 8 and the severity rate was 4, while contract work was 107 and 16, respectively.

When it is noted that the rates at present are 3.4 and 0.6 for government and 5.0 and 1.5 for contract for the entire Corps, one must concede that there has been excellent improvement in the injury rates.

The rates in the old days might have been even higher if there had not been some covering-up of injuries. On one river project the main mission of the safety inspector was to scatter a keg of nails in a field, so that the walking injured could pick up nails and thus not be counted lost-time

MORA A. FOREMAN is Safety Engineer, U.S. Army Engineer Division, North Atlantic Corps of Engineers.

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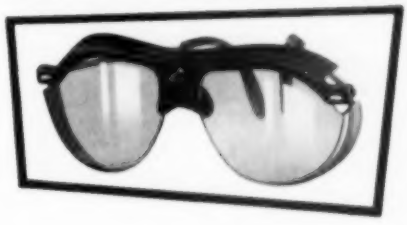
NO ☐

if you checked **YES,** *you need*

VISOR-TUC SAFETY SPECTACLES



Visor fits snugly against the forehead to provide over-eyes protection from glare and flying particles.

Shatter-proof, heavy-duty lenses meet Federal Specifications for the "drop ball" and "drop needle" tests.

Cup-type Lenses prevent entry of particles from side or bottom.

See your authorized Eye-Savers supplier for details, or write direct.

For details, see your Authorized Eye Savers Supplier or write direct

Quality Eye Protective Equipment ***Made by the Leaders in Plastics***

WATCHEMOKET OPTICAL CO., INC.

232 WEST EXCHANGE ST., PROVIDENCE 3, R. I.

In Canada: Levitt-Safety Limited, Toronto 10, Montreal 26, Winnipeg

injuries. The injured who were unable to walk sharpened axes and saws and performed other light sedentary jobs.

On another project, the accident report stated that a certain employee would not lose time, but added a postcript at the bottom of the report that "Man died at 8:00 p.m." One imaginative soul stated that a cow was coming down the road at 60 miles per hour and struck his parked vehicle.

However, when it was realized that such practices were not the objective of a well-balanced safety program, these efforts "to make a good paper record" were stopped. On the other hand, it is believed that many organizations today are penalized by psychotics, malingerers, gold-bricks and misfits—or, as one employee put it: "He was waiting for compensation to set in."

In the early days, safety was taken care of by a safety inspector, or clerk, who was appointed to that job by the superintendent or foreman to get the office out of his hair. This inspector had to give first aid, make out reports, get the place cleaned up before inspection by the main office, pick up the mail, pass out pay checks, and a million and one other duties which, at best, were only distantly related to safety engineering. In spite of all this, he sometimes did a good job.

A few years later, when these jobs were discontinued and superintendents and foremen were given the direct responsibility for accident prevention, the weeping and wailing could be heard for miles around. During this change-over, the downward trend of accidents stopped momentarily, but when these same supervisors realized that the responsibility was placed as it should be, the frequency of accidents again started to decrease.

One supervisor who took his duties seriously reported an accident in which one of his men was struck on the head by a board being nailed overhead. He stated that to prevent a recurrence, "Men had been instructed how to run when a board is *droped*, and labor should take a five-minute *brake* between passing boards so as to be sure that the previous board is up to stay."

At the inauguration of this new deal in accident prevention safety engineers in the Corps Divisions and Districts were reduced to a maximum of two and placed on a staff level—not as salesmen any more, but as advisors on all safety engineering matters. Coordination with engineering, operations, supply and other departments, gives what is believed to be the best possible protection to the workers and users of facilities under construction.

In providing this greatly improved safety system, every available source is used, including National Safety Council, National Board of Fire Underwriters, National Fire Protection Association and, primarily, on construction, the *Manual of Accident Prevention, Associated General Contractors*, and *Safety Requirements, Corps of Engineers.*

The value of these accident-prevention measures right here in my Division can be shown by some of the awards which have been won:

1952—North Atlantic Constructors, Thule Air Base, Greenland—Award of Liberty Mutual Insurance Company.

1953—Division received National

—*To page 138*

Do-It-Yourself

The post office recently objected to sending do-it-yourself voodoo kits through the mail. It seems there was a fraudulent air to the claims they could deliver good or bad hexes right from the living room—even though the manufacturer claimed they were for "the man who has everything." Next, we'll be hearing of do-it-yourself head shrinking kits—although there are professionals who'll do it for you now, for a fee.

Do-it-yourself at home has become quite a craze. You can have your next accident at home, too.

You could be furnished a do-it-yourself "grow old quick" kit. An explosive contraption guaranteed to blow up in your face if you don't follow the instructions for disposing of it. The charm of this kit is its homespun way of simulating the results of all sorts of situations which might arise due to not reading labels or following instructions.

Or an "internal complications" kit. An assortment of chemicals to whiff—similar to those used on the job. Has a wide selection of recipes so you can select a chronic case of poisoning, an acute case, a long-term cumulative exposure, an irreversible tissue damage plan, or a fatal with a $100 funeral tossed in.

Then there's the do-it-yourself "bone breaking" kit. Bottles of oil, water, and other slippery concoctions to pour on the floor and walk over. Results guaranteed.

And here's one with complete instructions for walking off the roof of your abode—with results simulating those when walking or driving through a busy intersection without looking both ways, or watching the lights, and getting struck by a loaded garbage truck.

Or the handy finger and toe shrinking duo. A portable power tool without a guard, and a heavy object to drop on the toe tips. You get double your money's worth with the toe shrinker since when you bend over to remove it after dropping on your toe, it's heavy enough to allow you to slip a few discs picking it up.

These are only a few of the kits available. Reports pour in day after day testifying to their ruthless effectiveness.

So, friends, don't make a public spectacle of yourself. Liquidate yourself in the quiet, relaxed, familiar surroundings of your own home—on your own time.

—Robert D. Gidel

Tuffy® Sling Bulletin

Reporting the Outstanding Performance of Union Wire Rope's Machine-Braided Wire Fabric Slings.

Tuffy's a Hard One to Kink... and a Breeze to Unkink!

You'll find it next to impossible to kink a Tuffy sling by hand. If you succeed, even with the aid of a vise, see how easily the braided fabric can be straightened out with no material damage.

Tuffy's Streamlined Ferrule is Pressed On Over Tucked Eye-Splices for 100% Strength of Sling

Tremendous machine pressure swages Tuffy's smooth-edged metal ferrule around the tuck splice. Metal virtually "flows" into the braided fabric interstices. This compressive treatment gives the eye of the sling 100% of the strength of the wire fabric. Eyes *stay* spliced!

Tuffy Hoist Line Delivers Big Extras of Dependability and Long Wear

Tuffy Hoist Line is a special rope construction for hoisting on all types of over-head, stiff leg and mobile cranes, derricks and clamshells. Combines extra flexibility and toughness to absorb load shocks. Tuffy slings and hoist lines work with hand-and-glove harmony to cut hoisting costs and downtime in every kind of materials handling.

Give Tuffy "the Works;" then Take a Long Look at the Increase in Sling Service You Get Per Dollar

Tuffy asks no coddling. Put Tuffy slings on your toughest jobs. Give them the "full treatment" of hard service. They'll take it, and then some. And you'll be ahead in dollars saved by Tuffy's longer wear and faster handling. The secret is the patented machine-braided construction of Tuffy slings. It produces a combination of extra flexibility and extra toughness never possible with ordinary wire rope — and a big step ahead of costly hand-braided slings. This 9-part Tuffy fabric is precision-braided by machine in a way that eliminates the inequalities of hand-braiding. Tuffy Slings have no cores. Even when one of the 9 parts is cut or broken, it does not result in stranding.

Watch Your Men Sling Loads Faster, Easier, with Greater Safety

Tuffy fabric and Tuffy's pressed-on ferrule team up to speed up sling work. The high flexibility and kink resistance of Tuffy slings make for smooth handling, and the Tuffy ferrule makes a pulled-out splice virtually a thing of the past. Because the ends of the ferrule are swaged flush with the machine-braided strands, there are no projections to snag on loads or injure hands. No wonder handlers work faster, safer, with Tuffy slings.

Your Tuffy Distributor will help you give Tuffy Slings and Hoist Lines "the works" test on the job you choose

FREE! Send Coupon for Handbook now

For Canada, Safety Supply Co., Toronto

union Wire Rope **corp.**

2224 Manchester Avenue, Kansas City 26, Mo.

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

MY NAME _____ TITLE _____

COMPANY NAME _____

ADDRESS _____

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PERSONALS

News of people in safety and related activities

Heads New Jersey Compensation Group

ELMER G. HUTZLEY, senior safety engineer at the Campbell Soup Company, has been elected chairman of the New Jersey Manufacturers Association's Workmen's Compensation Committee.

He heads a 12-member committee functioning to coordinate employer aims and objectives in the workmen's compensation field. It analyzes proposed statutory changes, maintains a continuous audit of administrative practices and carries on research in both these areas.

Prior to joining Campbell Soup Company 13 years ago, Mr. Hutzley was affiliated with Republic Steel Corporation, Dravo Corporation and Fleetwing Division of Kaiser Cargo Corporation.

Mr. Hutzley has been a member of American Society of Safety Engineers for the past 13 years. He has served as chairman of the South Jersey Industrial Safety Council, the Food Section, National Safety Council, and is a member of the executive advisory committees of both of these organizations. He was recently elected general chairman for the South Jersey area of the New Jersey State Industrial Safety Committee and is chairman of its Codes, Rules, and Regulations Division which is working closely with the Department of Labor.

His spare time activities include Disaster Committee and industrial first aid education work in the Camden County Red Cross, advisory director for health and safety in the Boy Scout Council, and speaking engagements to civic groups.

Other members of the Committee include: John Bastin, Bakelite Division Union Carbide & Carbon Corporation, Bound Brook; Oliver T. Clayton, Esso Standard Oil Company, Bayway; James W. Griffith, Riegel Paper Company, Milford; Ralph Hartman, Bethlehem Steel Company, Hoboken; Jacob J. Hoffman, M. W. Kellogg Company, Jersey City; Thomas R. Holden, Thermoid Rubber Company, Trenton; Philip G. McAndrew, Simmons Company, Elizabeth; Harold J. McCormack, A. & M. Karagheusian, Freehold; Harry McCorristin, T. C. Wheaton Company, Millville; Clifford L. Sheckler, Johns-Manville Corporation, Manville; and Raymond C. Sprow, Kuthe Laboratories, Newark.

Eliot Parker Named Army Safety Director

ELIOT V. PARKER, who developed the first safety programs for the War Department during World War II, has been appointed safety director for the First United States Army. HENRY M. FERGUSON, acting safety director, and since 1942, chief safety administrator on Governors Island, will continue as assistant to Mr. Parker.

Mr. Parker was for some time safety engineer with The Travelers Insurance Company, New York, and in 1941 was loaned by the company to the Office of The Quartermaster General in Washington, D. C., to establish the first War Department Plant Protection program, which later became the Internal Security Program under The Provost Marshal General.

In 1942 he received a direct commission as a captain in the Corps of Military Police. He established and supervised the first safety program put into effect by the War Department and served until 1946 as War Department safety director, attaining the rank of lieutenant colonel. He is now a colonel in the Reserves.

Eliot V. Parker

On reverting to civilian status he joined the Office of the Assistant Chief of Staff G-1 (Personnel) in Washington, and in 1946 was named the first safety director of the United States Army, a position he held until 1955.

He then transferred to the U. S. Department of Labor as Chief of the Division of State Safety Standards and Services. This Division is responsible for establishing and expanding assistance and developing safety activities throughout all industry, in federal departments and agencies, through state labor departments, trade unions, trade associations and governmental organizations. He resigned from this post last December.

In his new position he will administer and supervise the First U. S. Army Safety Program for all military personnel and Army civilian employees of the eight-state Army area.

He is a member of Delta Tau Delta fraternity, the National Safety Council, the American Society of Safety Engineers, and the Institute of Traffic Engineers.

A. G. LANE has been named to the newly-created post of director of training and safety for the Powder Actuated Tool Manufacturers' Institute, New York.

Mr. Lane has been associated with the powder actuated tool fastening business for several years. Formerly, he was with the Industrial Tool Div. of Remington Arms Co., Inc., Bridgeport, Conn., and Ramset Fasteners, Inc., Cleveland, Ohio.

In his new position he will be responsible for the development of training and safety programs, including on-the-job training, throughout the country. His services will also be available to state and municipal industrial safety organizations for establishing and drafting codes to control safe use and operation of powder-actuated

Fire Hazards!

STONEHOUSE SIGNS
For Accident Prevention

The fire siren! It tells of danger, destruction, loss. But before it ever sounded, there was a *cause*. Carelessness usually sparked the first small tongue of flame.

Jobs, property, even life, often pay the heavy penalty to fire. Its toll runs into staggering loss of investment and human values yearly.

Day and night these signs stand guard against the chances of fire. They warn workers of hazards and how to overcome them — help save property, jobs, life, at modest cost.

Our complete Catalog—64 pages, in full color—free on request.

Stonehouse
SIGNS, inc. • Stonehouse Bldg., 9th at Larimer • Denver 4, Colo.

MANUFACTURERS *"Signs Since 1863"*

ACCIDENT PREVENTION • *steel* SIGNS IN STANDARD COLORS AND DESIGNS

tools as well as to affiliated labor organizations at both a local and national level.

The Institute created the position with the goal of establishing uniform training methods throughout the country. "Use of powder-actuated fastening tools has expanded so rapidly in recent years that this step became necessary to insure that no unqualified worker would use them," R. F. Webster, secretary of the Institute, declared.

PATMI is a non-profit association of manufacturers whose primary purpose is to promote, develop, and insure safe use, operation and application of powder-actuated tools. Participating members of the Institute are Ramset Fasteners, Inc., a part of the Olin Mathieson Chemical Corp.; Remington Arms Co., Inc., and Omark Industries, Div. of Oregon Saw Chain Corp.

J. J. POLLARO has been assigned as chief of the Safety Branch of the St. Louis District of the Army Corps of Engineers, according to an announcement by Col. George E. White, Jr., district engineer.

Mr. Pollaro, who has been in the Construction Division of the District for the past 20 years, will fill the post recently vacated by LOUIS W. LOHNES, who has been appointed regional safety director for the Post Office Department.

During Mr. Lohnes' incumbency, the St. Louis District had attained the highest safety rating of any District in the United States. Mr. Lohnes was recently given a Superior Performance Award and was the St. Louis District nominee in the 1956 Civil Servant of the Year Program. His promotion to the position with the Post Office Department became effective on April 8.

JOHN B. DAVIES has been elected assistant vice-president of Mine Safety Appliances Company, Pittsburgh, Pa.

Formerly manager of industrial sales, he will serve in the newly-organized Industrial Products Group.

Mr. Davies is president of the

John B. Davies

Industrial Safety Equipment Association and a member of the American Society of Safety Engineers, the American Industrial Hygiene Association and the International Association of Fire Chiefs. He is a past president of the Veterans of Safety and a district director of National Sales Executives.

A native of Pittsburgh and a veteran of World War I, Mr. Davies is a graduate of Carnegie Institute of Technology. He joined Mine Safety as a chemist in 1919, five years after the company was founded.

GRANT O. SHIBLEY has been named safety director for The American Welding and Manufacturing Co., Warren and Niles, Ohio.

Formerly senior engineer in the Industrial Department of the National Safety Council, Chicago, Mr. Shibley is a veteran of 15 years in the safety field. Before his association with the Council he was safety director for the Ohio Boxboard Co., Rittman, Ohio, and for five years prior to that was assistant safety director for Goodyear Tire and Rubber Co., Akron.

Born in Warren, Mr. Shibley was graduated from the University of Akron with an AB degree in chemistry and biology, followed by two years of post graduate study in psychology and education at the same university.

Obituary

Voyta Wrabetz, Wisconsin Safety Leader, Dies

VOYTA C. WRABETZ, for 22 years chairman of the Wisconsin Industrial Commission, died in a hospital in Madison, April 9. He was 77 years old. Since 1919 he had been active in industrial health and safety, workmen's compensation and labor problems.

Mr. Wrabetz retired July 1, 1955, after 37 years of service to the state. He was esteemed by

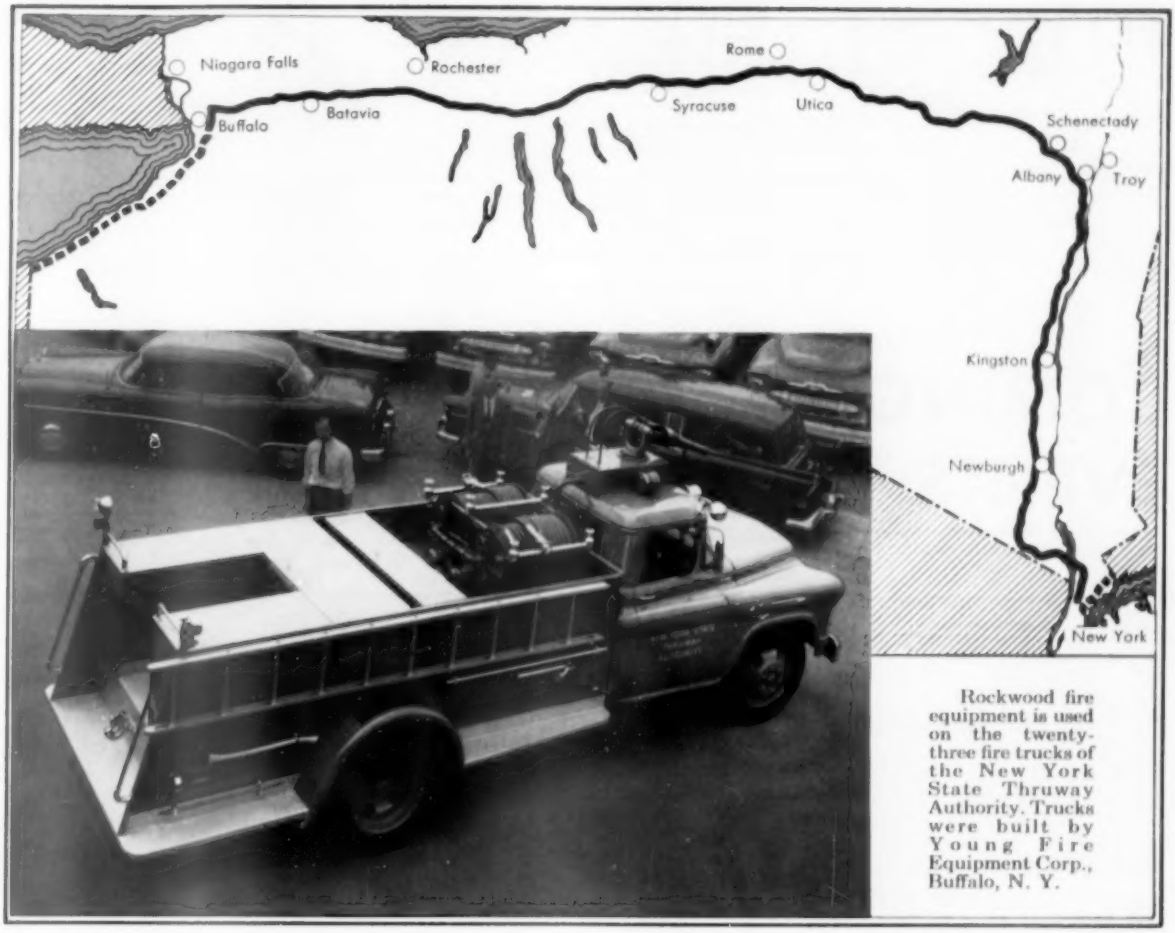
Voyta C. Wrabetz

management and labor alike and in 1955 the Legislature adopted a joint resolution praising his long and brilliant career.

Born in Kewaunee, Wis., Mr. Wrabetz was a country school teacher before going to the University of Wisconsin where he was a varsity football halfback and a Phi Beta Kappa honor student. He was graduated from the Law School in 1906.

Mr. Wrabetz entered law practice in Madison and also resumed his role as an educator, serving as a high school principal 1917-19 and later as state superintendent of public instruction until 1922.

In 1922 he also assumed the duties of examiner on the Industrial Commission Staff. He was appointed a member of the com-



Rockwood fire equipment is used on the twenty-three fire trucks of the New York State Thruway Authority. Trucks were built by Young Fire Equipment Corp., Buffalo, N. Y.

427 miles of New York State Thruway and Rockwood Fire Equipment is protecting it!

It takes versatile fire equipment to protect 427 continuous miles from fire — and Rockwood has just the equipment to do it!

Each of the twenty-three fire trucks used by the New York State Thruway Authority is equipped with — *Rockwood Manual Remote Control Turret, Type FFF FogFOAM . . . two Ground Sweep Nozzles . . . two Hand Line Nozzles with FF Extensions . . . a Piercing Applicator . . . and a Type D Proportioner for Rockwood FOAM and WET.*

From New York City to Buffalo these highly maneuverable fire trucks are ready to quickly control gasoline, oil or brush fires — and thanks to Rockwood Double Strength FOAM — they can do a big job with a relatively small amount of water.

Rockwood Double Strength FOAM, the fast-flow fluid FOAM, makes a minimum of 2,640 gallons of expanded FOAM extinguishing agent — using only 330 gallons of water!

Many leading fire truck users rely on Rockwood fire fighting products. Send for Rockwood's free booklet. Get all the facts on Rockwood fire fighting equipment — just fill in the coupon below. The Rockwood products have been tested and listed by Underwriters' Laboratories, Inc.

ROCKWOOD SPRINKLER COMPANY

Engineers Water . . . to Cut Fire Losses

ROCKWOOD SPRINKLER COMPANY
Portable Fire Protection Division
1572 Harlow Street
Worcester 5, Mass.

Please send me your illustrated booklet on Rockwood fire fighting products.

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City .....
Zone .... State .....

mission in 1927 and chairman in 1932.

Mr. Wrabetz had served as president of the International Association of Industrial Accident Boards and Commissions and of the International Association of Government Labor Officials.

Surviving are his widow, two sons, five grandchildren and two sisters.

COMING EVENTS

in the safety field

May 6-8, Allentown, Bethlehem, Easton, Pa.
Thirtieth Annual Eastern Pennsylvania Safety Conference. Harold A. Seward, secretary-treasurer, Lehigh Valley Safety Council, 602 E. Third St., Bethlehem, Pa.

May 8-9, Niagara Falls, N. Y.
Seventeenth Western New York Safety Conference, in cooperation with the American Society of Safety Engineers (Niagara Hotel). Patsy E. Gismondi, executive secretary, 1436 Delaware Ave., Buffalo 9, N. Y.

May 9-10, Baltimore, Md.
Annual Governor's Safety-Health Conference and Exhibit (Lord Baltimore Hotel). Joseph A. Haller, executive chairman, Safety Conference, Department of Labor and Industry, State of Maryland, 12 E. Mulberry St., Baltimore 2, Md.

May 9-11, Winston-Salem, N. C.
Twenty-seventh Annual North Carolina State-wide Industrial Safety Conference (Robert E. Lee Hotel). H. S. Baucom, director of safety, North Carolina Industrial Commission, Raleigh, N. C.

May 15-16, Des Moines, Iowa
Iowa Industrial Safety Association Annual Conference (Savery Hotel).

May 15-16, Oklahoma City
Ninth Annual Oklahoma Safety Conference (Skirvin Hotel). Bob Eastman, manager, Oklahoma Safety Council, 1600 N. W. 23rd, Oklahoma City, 6.

May 16, Lake Delton, Wis.
Rock River Valley Safety Conference. Allen Paschen, Northern Engineering Co., Baraboo, Wis.

May 20-24, Los Angeles
Sixty-first Annual Meeting of the National Fire Protection Association (Hotel Statler). Percy Bugbee, general manager, NFPA, 60 Batterymarch St., Boston 10.

May 23, West Allis, Wis.
Southeast Lakeshore Safety Conference. Dick Lutz, Falk Corp., 3027 W. Canal St., Milwaukee 8.

May 23-24, Duluth, Minn.
Thirty-third Annual Conference of the Lake Superior Mines Safety Council (Hotel Duluth). Allen D. Look, secretary, 329 Federal Bldg., Duluth 2, Minn.

June 4-5, New Haven, Conn.
Twelfth Annual Connecticut Safety Society Conference (Jewish Center Bldg.). Dennis J. Hickey, manager, Waterbury Manufacturing Co., Waterbury, Conn.

June 6, Chippewa Falls, Wis.
Northwest Regional Safety Conference. C. R. Johnston, Cornell Paperboard Products Co., Cornell, Wis.

June 11, Stevens Point, Wis.
Wisconsin River Valley Safety Conference. Victor J. Bukolt, Lullabye Furniture Corp., Stevens Point, Wis.

June 13, Neenah-Menasha, Wis.
Fox River Valley and Lakeshore Safety Conference. Howard Aderhold, Marathon Corp., Menasha, Wis.

Sept. 12-13, York Harbor, Maine
Thirtieth Annual Maine State Safety Conference (Marshall House). Arthur F. Minchin, secretary, Department of Labor and Industry, State House, Augusta, Maine.

Sept. 17-19, Cleveland, Ohio
Nineteenth Annual Ohio State Safety Conference (Hotel Carter). H.G.J. Hayes, secretary-treasurer, Suite 514-2073 E. 9th St., Cleveland 15, Ohio.

Sept. 23-26, Montreal, Canada
Annual Meeting of the American Transit Association (Sheraton Mt. Royal Hotel). Arthur W. Baker, general secretary, 292 Madison Ave., New York 17.

Oct. 16-17, Chicago
Second Annual Sanitation Maintenance Show and Conference (Navy Pier). Orkin Expositions Management, 19 W. 44th St., New York 36.

Oct. 21-25, Chicago
Forty-fifth National Safety Congress and Exposition (Conrad Hilton Hotel). R. L. Forney, secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11.

Nov. 13-15, San Francisco
National Conference on Standards (St. Francis Hotel). Cyril Ainsworth, technical director, American Standards Assn., 70 E. 40th St., New York 17.

Mar. 2-4, Memphis, Tenn.
Southern Safety Conference. W. L. Groth, executive director, Southern Safety Conference, Inc., P. O. Box 8927, Richmond, Va.

Mar. 17-19, Los Angeles
Fifth Annual Safety Congress and Exhibit. Joseph M. Kaplan, manager, Greater Los Angeles Chapter, National Safety Council, 3388 W. 8th St., Los Angeles 5.

Mar. 17-21, New York
Twenty-eighth Annual Greater New York Safety Conference and Exposition (Hotel Statler). Paul F. Stricker, executive vice-president, Greater New York Safety Council, 60 E. 42nd St., New York 17.

Sectional Executive Committee Meetings, NSC

May 8, New York
Chemical Section, Sheraton-McAlpin Hotel.

May 12, Kansas City, Mo.
Petroleum Section, President Hotel.

May 23-24, Lockport, N. Y.
Automotive and Machine Shop Section.

May 23-24, Cleveland, Ohio.
Power Press and Forging Section, Hotel Carter.

May 23-24, Cleveland, Ohio.
Printing and Publishing Section.

June 3, New Orleans
Railroad Section, Roosevelt Hotel, 1:30 p.m.

June 4, Marinette, Wis.
Air Transport Section.

June 7, Richmond, Va.
Fertilizer Section.

June 14, Carlisle, Pa.
Rubber Section.

Golfer (to member ahead): "Pardon, but would you mind if I played through? I've just heard that my wife has been taken seriously ill."

MR. SAFETY ENGINEER:

Here's Outstanding Head and Face Protection to Support Your Safety Program

Jackson Safety Hat, type SH-1

In heavy construction work, in the shipyards, and in many other fields, make Jackson Safety Hats and Caps your choice. Molded of glass fiber and polyester resins, they are light, resilient, tough and strong.

They exceed Federal Specifications for electrical resistance, impact, penetration, flammability and water absorption. Weight is well below the specified limit.

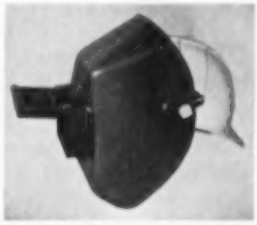
Hat has full brim all around, Cap has narrow brim with visor in front. Both are made in grey, white, yellow, orange, green, blue, brown and red.

NEW - Greatly improved headgear, more comfortable, more durable, on all fiber glass hats and caps. Made in one unit, its plastic headband holds its shape, retains its strength and flexibility under extreme weather conditions. Soft leatherette sweatband encircles the head.

Jackson Helmet H1-AP

This Welding Helmet, with Adjust-O-Lok headgear and plastic lens holder is one of 18 models. Nylon, wear-resistant and insulative, is used for headband, friction pivots and large, winged knob adjusting mechanism.

Helmet shell is of fiber glass plastic. Strong, light, highly resistant to moisture, it holds its shape, lasts many times longer than old-style helmets. Lens holder, of high-impact plastic, is insulative, heat resistant. No metal parts protrude, so no current can pass shell or headgear.



Three styles of helmets are offered pivoted to the Jackson Safety Cap. Type SCH-4 shows white cap and narrow shell helmet, lift-front lens holder.

Type WR-70

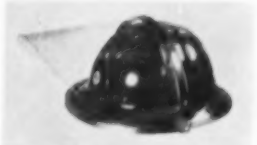
The Supergoggles (shown left) are one of three series of Jackson Goggles. A true cover-all style, they're wider, without being bulky, to be worn over today's larger prescription glasses and safety spectacles. Larger inside areas, well ventilated, make them cooler, more comfortable.

Made with elastic headband or plastic headrest, for *gas welding*, or, with clear hardened lenses, for *chipping* and *grinding*.

Cap-and Goggle combination shows Unigoggle for gas welding. Springs in telescopic arms hold goggle up or down.

Musketeer Headgear with Visor No. 39

New Musketeer headgear, durable and convenient, has Nylon headband and pivots, both adjustable while in use. Cross strap adjusts to height; wide spark deflector carries a choice of visors. Shown: fiber visor with welding lens for scarfing. Also several sizes of plastic visors, clear or in shades of green, and a wire screen visor.



Hat and Face Shield Combination. Eight-inch clear visor pivots on aluminum frame members.

JACKSON PRODUCTS

AIR REDUCTION SALES COMPANY, A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED

WARREN · MICHIGAN

SAFETY OFF THE JOB

Suggestions for company and community programs

By HARRY C. JOHNSON

NSC Staff Representative, OTJ Safety Committee

OFF-THE-JOB ACCIDENT SURVEY
Injuries and Man-Hours Lost, January-December 1956

	No. of Injuries	Man-Hours Lost	Average Hrs. Lost per Injury
Plant 1	11	3,194	293
Plant 2	8	1,790	224
Plant 3	22	5,052	230
Plant 4	18	1,788	99
Plant 5	97	5,083	53
TOTALS	156	16,907	108

No. of injuries, 156; home, 90; to and from work, 18; other 48.
Parts of body injured: head, 24; torso, 42; arms, 48; legs, 42.

OTJ Survey Shows 100 Lost Hours for Each Accident

A 12-month study, begun January 1956, of off-the-job accidents of five Charleston, S. C., industries has disclosed that 156 accidents accounted for 16,907 lost production man-hours—an average of more than 100 hours for each accident.

The accident survey was sponsored by the Charleston County Health Department in cooperation with the Pittsburgh Metallurgical Co., the General Asbestos and Rubber Co., the West Virginia Pulp & Paper Co., the American Tobacco Co. and the Charleston Naval Shipyard. Its purpose was to determine the extent of injuries occurring off the job with an aim toward preventing them.

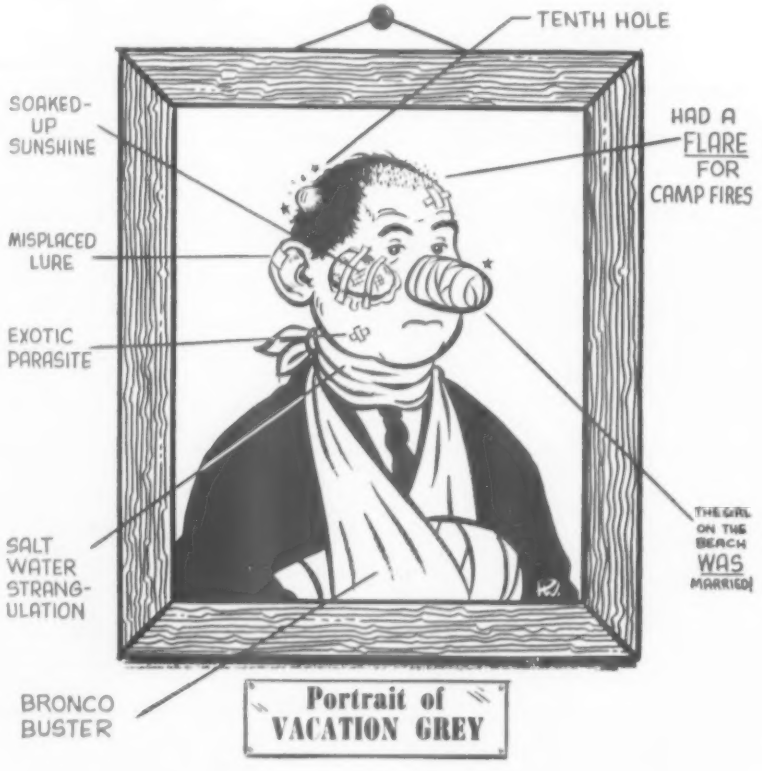
Analysis of the survey, which was based on voluntary accident reporting, showed home and yard accidents accounting for 90 injuries. Eighteen injuries occurred while workers were going to and from work and 48 were due to other causes such as recreation and public nontransportation accidents. Three deaths were reported during this period, one due to an auto accident and two at home.

Arms were involved in injuries 48 times, the torso and legs with 42 times each and the head 24 times. Severity of the injuries caused lost time from work for more than one month. Other injuries, more minor in nature, caused work loss of one or more days.

Statistics showed that each injury reported during this survey averaged more than 100 man-hours lost from the job. The highest average number of production hours lost per injury, for a single plant, was 293 lost hours, based on 11 injuries. The lowest average was 53 production hours lost by a plant based on 97 injuries reported.

During April and May nearly one-third of the total hours lost for the year was reported. The highest total hours reported lost by a single plant for a one-month period was 1,404. More than 12,000 employees are represented in the survey.

Information obtained as a result of the survey will be used to develop educational accident prevention programs to reduce injuries and fatalities in those areas found to be most troublesome.



VACATION safety cartoon by Phil Waters of Owens-Illinois appears in the May issue of NSC's Glass and Ceramics Newsletter.

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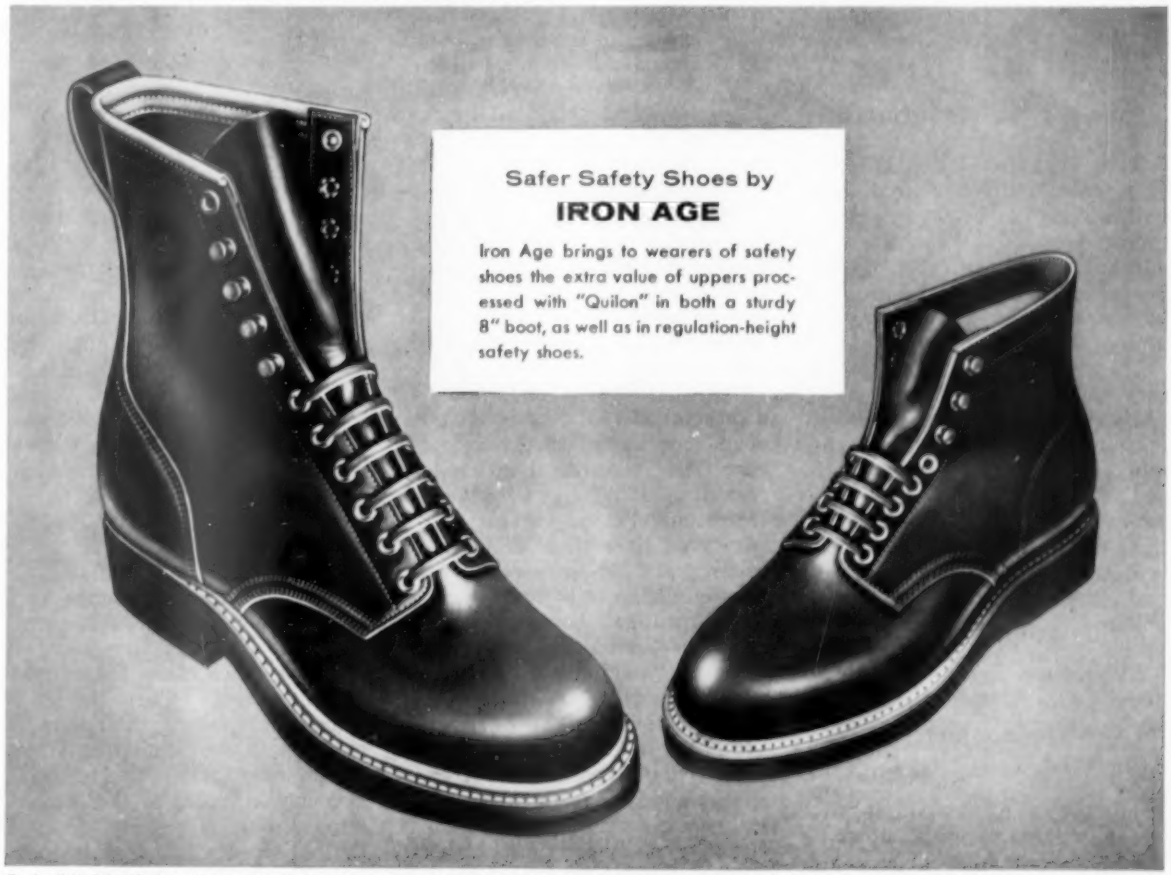
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Iron Age brings to wearers of safety shoes the extra value of uppers processed with "Quilon" in both a sturdy 8" boot, as well as in regulation-height safety shoes.

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Our Enemy the Rat

He's a tough, shrewd creature, a destroyer of property and a serious menace to health. These control measures will help

RATS are among our most destructive animals. They consume immense quantities of food, pollute a lot more, and carry the germs of many diseases. For centuries they have shown ability to survive under the most difficult conditions and to avoid traps, poisons and their natural enemies.

A balanced control program involves:

1. Sanitation—taking away food and cover.
2. Ratproofing—building him out of places where he can get food and shelter.
3. Reduction—by various methods of killing.

The first two methods may be classed as "permanent" control. Reduction methods are only temporary.

Sanitation. Careless refuse disposal is a great help to the rats. Garbage cans are often improperly covered. If not secured, dogs will knock them over. If they aren't picked up again, the rats will have a banquet. Cans should be put on racks off the ground, because rats will not hang around a place that's out in the open.

They won't run in the open if they can help it. They like to have something solid on one side so enemies can come only from the other side. Even raising a fence six inches discourages them. With wire fences people can see what their neighbors are throwing out.

Stored material—lumber, brick and stones—should be stored about 18 inches off the ground.

Ratproofing needs continual maintenance. Ratproofing a building is not too difficult but rats are quick to find gaps in the defenses and their teeth are like tool steel.

Hardware cloth should have no more than half-inch openings to keep out rats—one-quarter inch for mice. A young rat will get through anything more than a half inch in diameter. If he can get his skull through, the rest of his body will follow.

Bricks are good. Concrete should be a good hard mix, at least three inches thick. Metal should be 24 gauge or heavier.

All entrances three feet above and three feet below gratings should be closed by windows with metal screening. When rats get under a building with no basement, an L-shaped curtain wall which goes down two feet and then extends out one foot will deter them. When they burrow down alongside this wall to get into the building and hit the L they are said to give up.

Reduction. Take away food and cover and you'll reduce the animal population that can be supported by that area. But often it is necessary to supplement sanitation and ratproofing with some method of extermination.

Tracking dust sounds like a good method. All you have to do is put out the poison where rats run. The rat picks it up on his feet, licks it off them, and dies. Unfortunately, the various products used have their drawbacks. Compound 1080 is deadly to rats but equally so to higher forms of life. Antu has been used with some success but sublethal doses build up immunity. DDT has proved good for mice but is not effective for rats. Warfarin has been used but it rather expensive.

Cats, dogs, ferrets, owls, hawks, snakes and other natural enemies kill enormous numbers of rodents but they can't keep up with these prolific pests. A rat puts out three to five litters a year with eight to ten in each litter. However, the presence of these animals does keep rats and mice from setting up housekeeping and thus keeps down the birth rate somewhat. Unfortunately, some of the best rat killers are not good pets, particularly for urban communities.

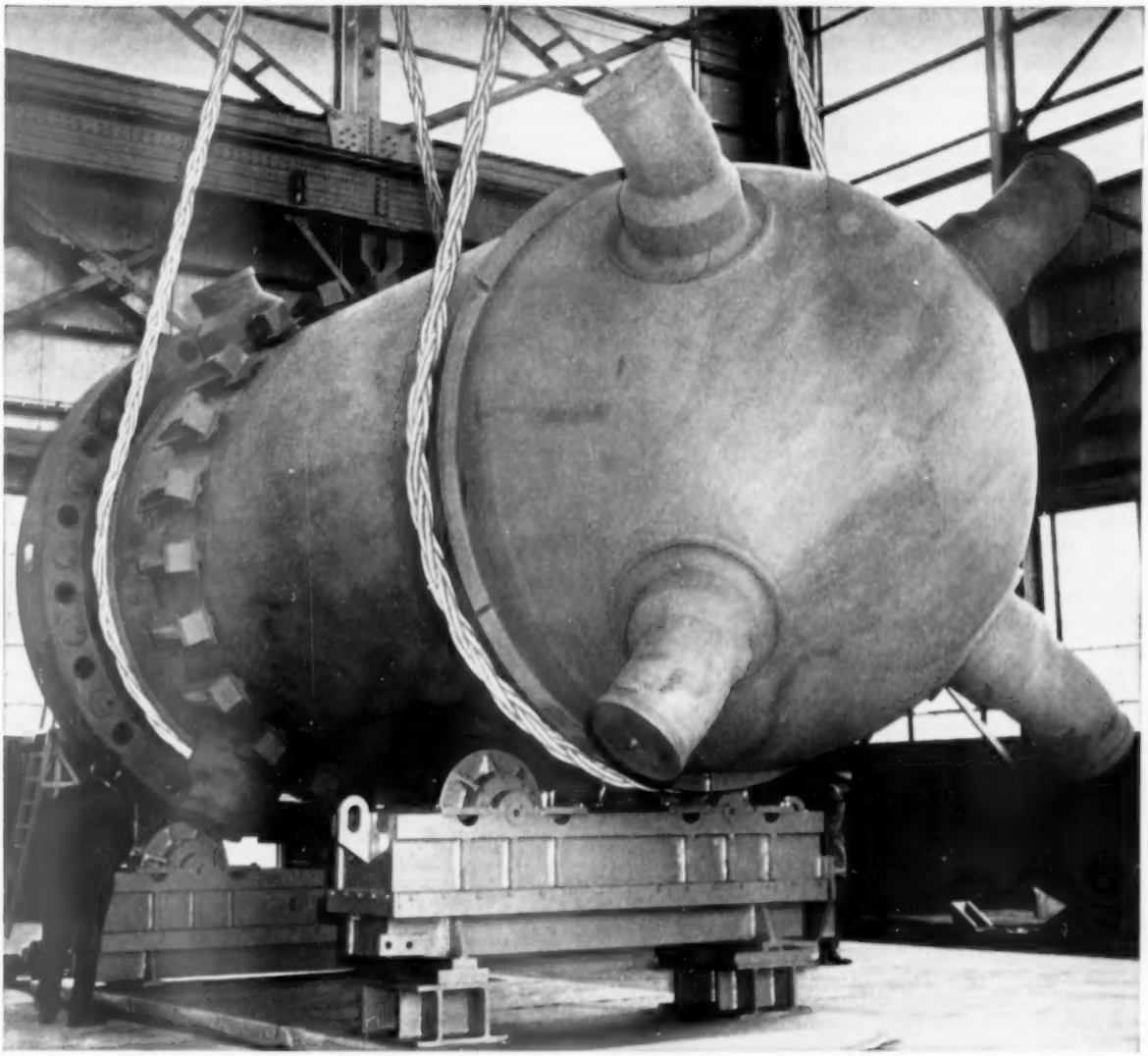
Viruses have been used to some extent in Europe but their use is not without risk to man. The virus is put on the bait and the disease it carries spreads through the rat community, but there is a chance it wouldn't stop there. This method is definitely not recommended.

The glue board, a rodent form of tanglefoot, is another method which has been tried by some professionals. Trapping would seem to be just as effective and much less trouble.

Even ultrasonic devices have been used. The theory is that high frequency sound will drive rats out of a building. Unfortunately, a rat's hearing is approximately in the same range as a human being's and sound which would rout them would have the same effect on people. The device, it might be added, is a rather expensive toy.

Traps are much more effective. Several types may be used. One of the more complicated and expensive varieties is the electronic trap. A big box is set up and the rat comes in. An electric eye slams the door behind him. The rat passes through another exit and another door closes behind him. He goes up into another chamber which closes the current and he "fries." Then the door drops and throws him into a bucket and the death trap is set for the next victim. This contraption might appeal to the gadget-minded but its superiority over the old wooden bait trap is questionable. *(—Turn page)*

THIS ARTICLE is based largely on a paper by William D. Fitzwater of the United States Fish and Wild Life Service, at a seminar on industrial sanitation conducted by Arwell, Inc., Waukegan, Ill.



The husky Slings that lifted world's heaviest atomic unit

This is the 150-ton shell of a reactor vessel, and it is said to be the heaviest unit of atomic equipment in the world. With head in place, the vessel's weight is increased to a staggering 235 tons.

Built by the Chattanooga plant of Combustion Engineering, Inc., the vessel has an inside diameter of 9 ft and steel walls 8½ in. thick. It will be used in America's first commercial-sized nuclear power station. Prior to shipment it was exhibited by the builder, and the photograph above shows the shell on display.

Lifting and moving the big shell was quite a feat. Two tremendously strong Bethlehem slings were used, and the slings themselves could hardly be called pygmies. Fifty-nine ft in length, they were the eight-part-braided type with ropes of 1¼-in. diam. Rope construction was 6 x 37, which of course gave a high measure of flexibility.

You yourself may never require such husky slings. But please remember, Bethlehem can furnish *any* size or type of sling, standard or special. Whatever your needs, Bethlehem can meet them. Promptly, too. Call on us for grommets, single-part or braided slings, any type of bridle, or anything that will help meet a special problem.

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It isn't necessary to wear gloves when setting traps. Everything a rat touches smells of human beings and he'd become a neurotic wreck if he were afraid of it.

Gas. Carbon monoxide, the by-product of a gasoline engine, can be used outdoors. Put a hose on the exhaust and insert it in the burrow.

Chloropicrin (tear gas) has the advantage of being a repellent. Burrows treated with it are said to be repellent for six months. It is rather rough stuff to handle.

Methyl bromide should be left to professionals. It's a powerful gas and has to be handled carefully by experienced persons.

Calcium cyanide is best applied with a foot pump. While highly toxic, it is lighter than air. Out in the open it rises rapidly and is soon dissipated. It has a powerful odor which gives effective warning.

Poisons

Poisons are the most extensively used materials for rat reduction. Barium carbonate, one of the earliest poisons, is now little used. It takes too much to kill and rats don't like it.

Red squill is one of the safest poisons. It is rather bitter-tasting and acts as an emetic on most animals. Rats, however, lack a nerve center that produces vomiting.

Arsenic is rather inconsistent in its effects and is not used extensively.

Antu was once believed to be the answer to the rat problem but results have been disappointing. Animals eating it in sublethal doses build up an immunity. Rats detect it readily and after one dose they'll stay away from it.

Thallium is an effective poison. It is highly toxic and should be used only by a professional. Some commercial mouse baits contain it.

Zinc phosphide, a phosphorus compound, is one of the best rodenticides. The odor is attractive to rats and mice. Generally, phosphorus compounds are inconsistent. They not only vary among the products of various manufacturers but even within the same brand. The smaller the particle the more effective the product.

Strychnine is fairly effective for mice but not for rats. Animals eating it will have a muscular spasm within 10 minutes and if it doesn't kill, they will avoid it in the future. Small doses build up immunity.

Compound 1080 (sodium fluoroacetate) is one of the most powerful rat poisons. It can be used only by professionals—well covered by insurance.

Poisons can be used with several types of baits. A rat drinks twice as much as he eats so milk and water are good baits. Fish and meat are standard baits. With them you can use almost any type of poison.

With liquid bait, the poison must not have an objectionable taste. Cereal baits, like liquids, are bland. Zinc phosphide, phosphorus compounds and warfarin can be used with cereal. But with red squill you have to stick to meat and fish.

Vegetable baits are good. Antu and zinc phosphide may be used on potatoes, carrots and fruit. Rats like both moisture and fruit.

Warfarin takes three to seven days to kill a rat and two weeks or more to kill a mouse. It prevents the formation of prothrombin, the blood clotting agent, and the animal bleeds to death. He doesn't associate his ill feeling with the poison. Apparently, rats and mice can taste it but in the weak concentration it isn't objectionable. They'll take it repeatedly and these repeated doses finally kill them.

"I had it ground to my prescription. I look awful in glasses."

Warfarin comes in both concentrate and ready-mixed forms. The ready-mixed material is more convenient but it has to be made to keep on the shelf. The concentrate is preferred.

Rats like freshly-mixed bait and the concentrate is cheaper. Non-degerminated corn meal makes up the bulk of the bait and five per cent confectioner's sugar is added. Rodents have a sweet tooth.

Rats are migrants. Normally, of course, if a rat has plenty of food and cover he's going to stay there. But the young ones want to see the world, so there is constant re-invasion from other rat colonies.

If you have an installation to protect, first look at the sources from which rats are coming. The dump, of course, is an excellent breeding place. While there is plenty of food and shelter there, rats will still move out and re-infest surrounding territory.

Woodlands, agricultural lands, waste lands, slum areas, and even good residential and shopping centers all have rats. Rats do not move in great numbers across open spaces. They're more apt to move along roads and fence rows, in, through and under stock piles, through old storehouses, getting under loading docks and from there into the plant. So first clean up outside material to discourage rats from living around the plant.

Outside bait stations, called "perimeter control," reduce rodent pressure against the plant, killing the animals outside, rather than waiting until they get inside.

Warfarin has to be put outside in a container and under a protective device. A metal pan is good. Rats use paper pie plates to feather their nests, dragging them back to their burrows and spilling the bait.

Bait stations are necessary with Warfarin because the bait has to be out two weeks or a month. It must be protected from the weather and kept from other animals because it will kill them if they eat it repeatedly as rats do.

Under a bait station the rat feels he has protection and is more likely to return for more food. Water should also be placed in the bait station. With plain water or Warficide (water-soluble War-

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US RUBBER Mechanical Goods Division

United States Rubber

farin) the bait station is doubly attractive. Rats that come to feed will stay to drink. The effects of Warfarin depend on repeated doses. It has to be made attractive to get the animals to come back.

Don't Ignore Mice

Where rats go out, mice come in. They seldom live in the same area. If rats are not too numerous, there may be a few mice, but where there are no rats there are usually mice.

Actually, mice are harder to kill than rats. It takes from three to seven days to kill rats with Warfarin. It has taken as long as a month to kill caged mice. The mouse doesn't eat as much. He doesn't travel as far as a rat. Mice will live and die in an area of 20 square feet. They're harder to keep out of buildings. To keep them out every opening of more than a quarter inch must be blocked.

Sanitation isn't always the answer. Even missed sweepings are enough to sustain a mouse's life.

Mice are less dangerous than rats only because they're smaller. They're just as dirty and carry as many diseases. In proportion to their size they can do just as much damage.

Mice are more easily trapped than rats. Rats are more suspicious. You have to put traps right on the runway or make artificial runs the rat will go through before he snaps your trap.

For mice, traps can be baited very easily. The old standard, cheese, is all right. However, mice have a sweet tooth and gum drops are attractive bait.

N.Y. Convention Dates Set for Next 3 Years

THE GREATER New York Safety Council, Inc. has announced the dates of its Annual Safety Convention and Exposition for the next three years:

1958—Apr. 14-18
1959—Apr. 13-17
1960—Mar. 28-Apr. 1.

Further information may be obtained from Paul F. Stricker, executive vice-president, 60 E. 42nd St., New York 17.

Research Advances Fire Protection

Since 1914 National Bureau of Standards has been adding to knowledge of fire protection principles and techniques

CURRENT advances in fire protection technology at the National Bureau of Standards may provide a means to reduce further the loss of lives and property due to accidental fires. Many of the Bureau's recommendations have been incorporated in underwriters' and municipal building codes. However, there is a continuing need for technical information on the fire hazard properties of new building materials and structural assemblies.

Much of the Bureau's activity in these areas results in technical papers and reports which make data available to science and industry. Such information is frequently used as the basis of equipment design, specifications, and building codes.

To provide basic information on ignition phenomena and fire resistance of materials, on flame detection and extinguishment, and on fire growth and spread, the Bureau has carried on an extensive program of research and development since 1914. This program, now under the direction of A. F. Robertson, was initiated to resolve the early inconsistencies of building code requirements for fire protection of building structural elements. The objective of the work was to furnish architects, engineers, city officials, and insurance companies with technical information on the behavior of various materials under the special conditions found in burning buildings.

THIS ARTICLE is based on a paper presented at the Fire Research Correlation Conference under the auspices of the Committee of Fire Research of the National Academy of Sciences and the National Research Council. The paper will be published by the NAS-NRC, Publication No. 475.

To date, about two-thirds of the more than 600 building construction fire-resistance ratings published by the National Board of Fire Underwriters are based on the results of NBS studies. Other indications of the success of this activity may be found in the standard fire-resistance test methods and in the studies of the compressive strengths of building materials at elevated temperatures.

Recent studies have included self-ignition behavior of materials, detection of fires by flame characteristics, methods of measuring surface flammability of materials, mechanisms by which extinguishing agents are effective in fire control, and behavior of materials and constructions as fire barriers.

Self-Ignition

Ignition characteristics of materials have frequently been reported in terms of an ignition temperature. Such critical temperatures are very elusive. The Bureau is working to obtain a clearer picture of the actual mechanism of slow combustion reactions and the conditions under which they take place. Experience with solids in constant-temperature ovens has revealed the desirability of making measurements in such a manner that specimen size has little if any effect on the experimental results.

An adiabatic furnace has proved useful in analyzing ignition behavior under such conditions. Work to date with this equipment indicates that the slow ignition reaction of wood and other cellulosic materials displays the general characteristics of a simple first-order chemical kinetic reaction. This is not strictly the case,

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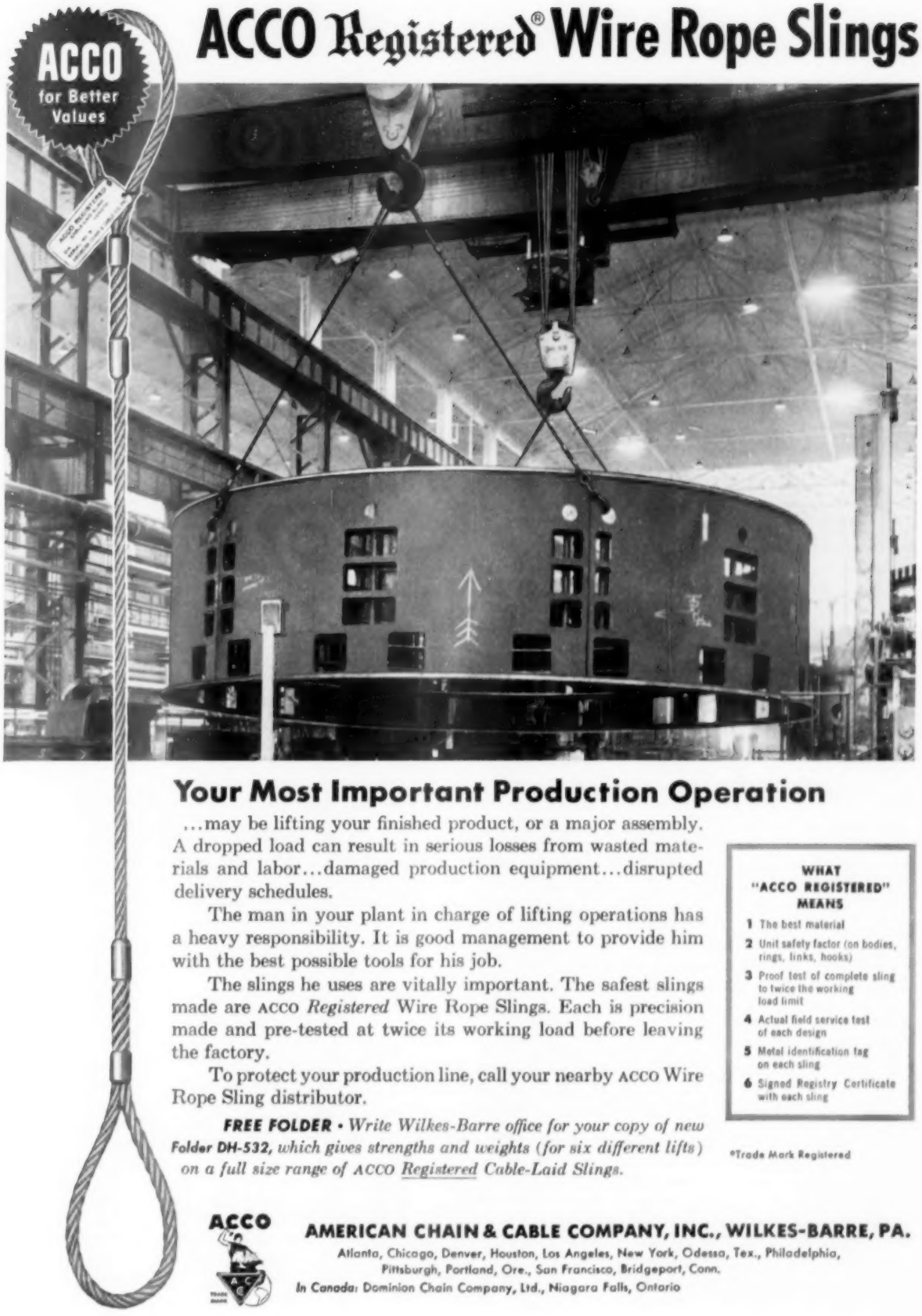

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however, since there is now evidence that a large number of different reactions are taking place.

Nevertheless, it is believed that this method of test provides one of the most useful methods of evaluating the potential storage hazard for bulk materials that may be subject to self ignition. Eventually it may become possible to develop charts that predict safe storage practices for such materials in terms of material involved, ambient temperature, size of piles of material, and type of ventilation.

Surface Flammability

The rate at which fires grow within a building is affected by the type of interior finish used in the construction. Other variables such as combustible content, ventilation, degree of compartmentation, and configuration also seem to be important.

Studies of the rate of growth of fires in buildings are desirable if the hazards to life and property are to be assessed quantitatively. However, the cost and the effort that must be expended on full-scale fires are strong deterrents to such investigations. Immediate attention has therefore been given to developing a laboratory flame spread test method for evaluation of surface flammability of materials.

In this method, ignition is forced at the top of an inclined specimen surface so that combustible gases and flames rise while the flame front on the specimen surface progresses downward. The rate at which the flame moves depends on the characteristics of the material. Both rate of flame travel and rate of heat release (as indicated by exhaust stack thermocouple temperature rise) are observed and their numerical values are combined in an arbitrarily established equation which gives a flame spread index.

The test provides manufacturers and testing laboratories with a reproducible means of studying flammability on a small scale. Acceptance of the flammability ordering achieved by this method as a true indication of fire hazard of the material tested must await full-scale fire growth studies. Other laboratories have elected to use model structures whose behavior has been correlated with a limited number of fire tests of full-size rooms. While excellent progress has been made in these studies, additional work must be done before real confidence can be placed in the general use of such models.

Extinguishing Methods

New variations of the dry chemical type of fire extinguisher have recently appeared. In most cases the extinguishing agent is a specially processed sodium bicarbonate powder. Evaluation of such devices with respect to other types of extinguishers has accentuated the need to understand the mechanism by which they achieve their effectiveness.

The frequently mentioned theory that dry powder extinguishes flammable liquid fires by release of carbon dioxide does not appear to be tenable. Fires have been quickly extinguished by relatively inert powders such as silica.

Optical measurements have been made of the effectiveness of dry chemicals in shielding the fuel against radiation from the flames. These experiments show that on actual fires the cloud of dry chemical does form an effective radiation barrier, thus reducing the effectiveness of radiation from the flames in vaporizing fuel in a form suitable for combustion.

Results of these studies, it is expected, will not only permit selection of more effective fire extinguishing agents but also provide a better understanding of the factors in evaluating extinguisher performance. While there is definite indication that the radiation shielding effect is important, there is also considerable evidence that some additional mechanism is present in breaking the combustion chemical chain reaction.

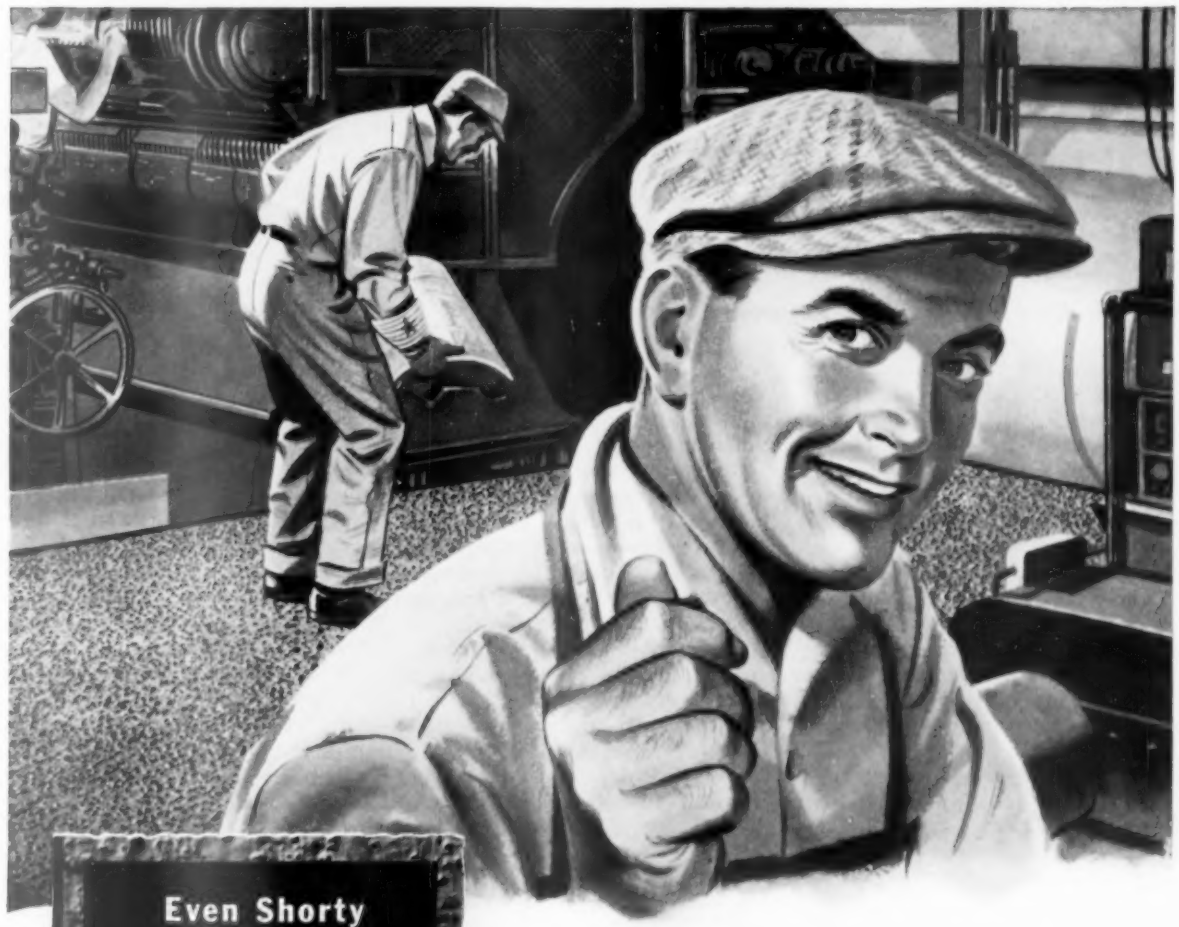
Fire Barriers

Studies of the fire resistance of materials and structures have been carried on almost continuously. Because of the many structural variations and the complexity of analysis of thermal and mechanical behavior, these studies have usually been empirical.

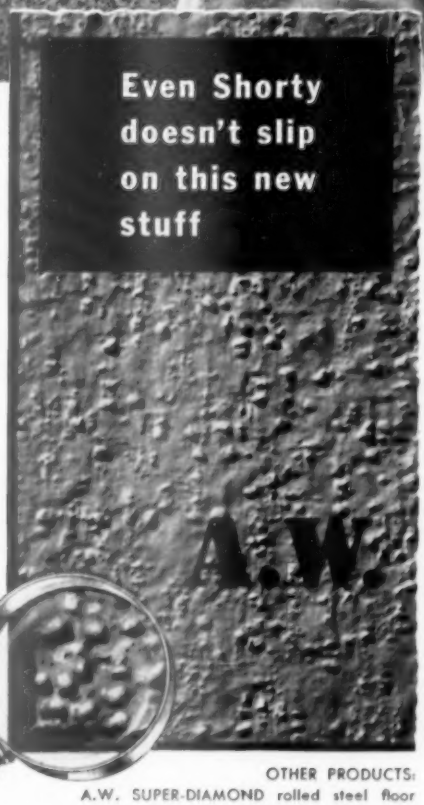
A standardized test method determines the fire resistance performance of materials and evaluates it in terms of the exposure time during which the structure maintains stability and prevents excessive heat transfer. The behavior of such simple structures as monolithic concrete slabs during such tests is extremely complex.

The presence of water, chemically bound and absorbed, seems desirable in such a structure since the latent heat capacity is very large and may serve to increase the fire endurance. However, in certain types of concrete, large amounts of absorbed water may be harmful. The pressure developed from water vaporizing within specimens has been blamed for severe spalling in several cases.

To achieve reasonable answers in making concrete slab computations, it has been necessary to use values of thermal diffusivity which differ by a factor of three from handbook values. For these computations it had been assumed that conduction alone was sufficient to account for heat transfer. However, this is not true; migration of moisture provides another important transfer mechanism. There is also evidence that radiant heat transfer is an important factor during fire exposure of cellular concretes. Further work should be done on measurement of thermal properties during such transient heating conditions.



Even Shorty doesn't slip on this new stuff



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Keeping Tab on Radiation

Monitoring equipment to be installed in nation's first nuclear power plant to prevent air contamination

KEEPING radioactive material out of the atmosphere will be an important function of the radiation monitoring system recently completed by Westinghouse Electric Corporation for the nation's first nuclear power plant.

The plant, near Shippingport, Pa., is being built by the Duquesne Light Company and the Atomic Energy Commission. It will be operated by Duquesne Light and is due to go "on the line" in 1957.

The monitoring system, designed and built by the X-Ray Division of Westinghouse in Baltimore, will also have the following responsibilities:

1. Check for leakage in the reactor's water cooling system.
2. Check the radiation accumulation in the boiler compartments, to make sure that the areas are safe to enter for maintenance during shutdowns.
3. Check for contamination in the ventilating and cooling air.
4. Keep a continuous chart record of radiation in the various areas of the plant.

If radiation levels in the selected areas exceed the preset limits, alarms will be actuated by contact meter-relays, furnished by Assembly Products, Inc., Chesterland, Ohio. If contamination is detected in the air systems being monitored, the meter-relays will also actuate solenoids. These in turn will operate butterfly valves to stop the circulation of air.

To insure precise monitoring of radiation at lower levels, and at the same time provide for a wide range, the dials of the meter-relays have three-decade logarithmic scales, instead of linear ones. Detectors used include GM tubes, ionization chambers, and air particle detectors.

Like all equipment used in the monitoring system, meter-relays must have reliability and maintenance-free operation. They also offer a means of combining a constant visual indication of prevailing radioactivity with easily adjusted preset limits of radiation. The principal alternatives, passed over primarily because of their bulkiness and greater complexity, would have been ordinary panel meters hooked up to electronic alarm circuits.

The radiation monitoring system will be housed in the auxiliary control room of the Shippingport power plant. This centralized location will not only permit quick reading of radiation levels but will also simplify maintenance. The electronic circuitry for each of the eleven channels is mounted in the equipment racks on "roll-out" type slides that allow immediate access. In the rear of each rack are large removable doors.

Basically, each channel in the system consists of a radiation detector which produces an electrical signal proportional to the activity present; an inter-connecting cable that feeds the signal to a computer-indicator; and a computer-indicator that converts the signal into an intelligible meter indication. With only one exception, each channel includes a background flasher to indicate channel operation when the radiation level is insufficient to cause a meter deflection. A DC signal is provided to drive a strip chart recorder.

PROJECT ENGINEER Kenneth Kiesel adjusts one of contact meter-relays on radiation monitoring equipment to be installed in nation's first nuclear power plant at Shippingport, Pa. If radiation level exceeds preset limits, the meter-relays actuate alarms or safety devices.

Point horn, pull trigger, fire's out! That's all it takes to knock out deadly fire with instant-action Kidde dry chemical portable extinguishers! So easy to use, even inexperienced operators get perfect fire-fighting results. Kidde's patented diffuser horn spreads dry chemical powder over wider area for greater fire-killing power. Trigger-release means faster action, feels more natural in the hand. Pick the Kidde dry chemical portable to fit your needs: 5, 10 lb. pressurized (recharged at any commercial air pump), 20, 30 lb. cartridge operated. For more information on dry chemical, carbon dioxide and wet chemical extinguishers, write today for Kidde's P-8 catalog and name of nearest distributor.

Kidde

Walter Kidde & Company, Inc., 545 Main St., Belleville 9, N. J.

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Safe in Heat That Broiled A Steak

HOT SEAT! Demonstrator (left) sits in flaming wicker chair in an industrial furnace heated to 1,200 F. At right, engineers are safe after six exposures of two to three minutes each. Suits are aluminum-coated fabric.

A SUIT THAT enables a man to work in temperatures one-eighth as hot as the sun's surface was demonstrated in New York recently.

The demonstrator six times entered an industrial furnace heated to 1,200 F., the highest temperature ever entered publicly for more than a few seconds. He stayed two or three minutes each time as if on a repair or rescue mission.

The demonstration—sponsored by Minnesota Mining and Manufacturing Co., St. Paul, Minn.—was held to show the heat-protective qualities of fabrics coated with a thin layer of aluminum, a process developed by 3M. The aluminum-coated fabric reflects radiant heat instead of insulating against it.

This permits less bulky insulation, it was explained, so that a man can move and work at temperatures higher than ever before to repair, investigate, inspect, rescue or extinguish.

To demonstrate the intense heat from which he was protected, an engineer wearing the aluminum-coated suit walked into the 1,200-degree oven carrying an armload of wood which burst into flames while he held them.

He returned with a sheet of steel wool which flared almost immediately, and then a manikin wearing a fireman's rubber fire-fighting coat and another wearing ordinary street clothes, both of which burned while he was unaffected.

He took in a wicker armchair and sat in it while it burned, and he topped off the demonstration by carrying in a half-inch-thick steak that cooked to medium-rare in about 1½ minutes—while he didn't.

The demonstrator was D. J. Bennett, an engineer from Zanesville, Ohio, who reported he had tested the suit previously "about 200 times" in industrial repair work in ceramic kilns at temperatures in the 1,200-degree range.

The furnace selected for the demonstration was a ceramic box furnace at Seaporcel Metals, Inc., Long Island City, where temperatures could be maintained at an even 1,200 F.

Bennett said he had worn the suit into higher temperatures, up to 1,400 degrees, and "never felt the heat."

The suit used in the demonstration—produced by Fyrepel Products, Inc., Newark, Ohio—has the aluminum coating on a fibre glass material which is backed up with fibre glass quilting. It is designed for intense heat.

Other existing garments are produced from 3M's aluminum-coated light asbestos (1.2-pound herringbone, Underwriter's grade) or aluminum-coated cotton duck. These require no other insulation. Their light weight, flexibility and durability permit them to be worn all day by workers in hot areas, such as near steel furnaces.

Both the cotton duck and light asbestos are equally heat-protective, but the asbestos also protects against molten splash while the cotton duck does not, 3M representatives said.

One safety garment maker uses aluminum-coated glass fibre material, backed by a layer of rubber, to produce a fireman's fire-fighting coat. The result is a lighter coat, easier to work in, yet with greater heat protection. The layer of rubber makes the coat waterproof.

The suit used in the New York demonstration is designed by Fyrepel to protect against intense heat, and permits a man to work for several minutes at a time in temperatures up to 1,200 F.

The 3M company announced it is now coating aluminum on asbestos and cotton duck as stock items, and is coating such other materials as fibre glass on special order.

Twelve manufacturers of industrial clothing are now offering aluminized clothing.

An egotist is a man who thinks as much of himself as you think of yourself.

Another unforeseen expense for a motorist is having his car overhauled by a cop.

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Industrial Health

—From page 64

female groups classified separately.

The average frequency rate was about 2.5 absences per year. The average disability rate was 3.4 days lost per 100 scheduled work days or about 8 days per year. Both frequency and disabilities rates decreased with age, except that owing to greater severity of illness for older workers, the disability rate increased in the age group 55 years and over. Sixty-four per cent of the absences were for single days, and 92 per cent lasted less than 1 week.

Although only 8 per cent of the absences lasted 6 days or more they accounted for one-half of all time lost. Over three-fourths of the absences were caused by nonoccupational disabilities and 14 per cent were due to personal reasons.

For the entire male group the average frequency rate was one absence per employee per 100 scheduled work days and the average disability rate was 3 days per 100 scheduled work days. Greater age was correlated with lower frequency and disability rates with the exception of the increase in disability rates for the 55 year and older age group.

Factors that resulted in increased job or personal responsibility were correlated with lower absence disability rates for younger workers. For workers 45 and over age itself appeared to be a factor in keeping rates uniformly low. Men 45 and over were almost 50 per cent of the total male group but accounted for less than one-third of the one day absences and only two-fifths of the absences of 2 to 5 days or 6 days or more.

This group tended to stay out for longer periods of time when absent but the proportion of time lost by this group was no greater than would be expected on the basis of representation in the firm. Personal and nonoccupational causes were less important for older workers than for workers under 45.

For women the average frequency rate was 1.4 absences per employee for 100 scheduled work days and disability rate 5 days per employee per 100 scheduled work days. They had a distinctly less favorable absence record than did men and this was particularly true for the group of women over 45. A smaller number in the older age group and the unique composition of the female group made generalizations on the basis of these findings difficult.

This record clearly supports a finding that the absence experience of workers over 45 does not compare unfavorably with that of workers under 45. A considerable number had no absences during the year and even among those with the highest absence rate the contribution was less than proportional to their numbers. The average frequency and disability rates of the group aged 45 and over were not sufficiently lower than the younger group to be statistically significant.

The slight difference emphasizes the point that the work experience of the older worker is not worse than that of the younger and suggests that it may be better. An increased awareness of the production needs of the firm, a decreased concern for minor ailments, and a greater sense of responsibility in reporting for work may be qualities that become more important with advancing years and produce the kind of experience this study found prevailed.

In any case, the findings should help lay to rest one unjustifiedness about the older employees ability to work and should help give him more equal status in competing for available jobs.

X-rays in Pediatrics

"Radiation Exposure of Pediatricians," by Peter J. Valaer and Mitchell R. Zavon.

THIS SURVEY covered 55 members of the Cincinnati Academy of Medicine, who restricted their practice to the care of infants and children. Forty-five of these 55 pediatricians used x-ray equipment in their practices, although only 35 x-ray installations were used by the group, because of sharing of offices and equipment. None of the physicians used radium or radioisotopes or made x-ray pictures. The survey was therefore confined to the fluoroscope.

An electrical device which automatically measured the time that the x-ray current was on was connected to each of these fluoroscopes to measure and record the actual use of the equipment during the survey.

The exposures of the physicians were measured by means of 200-milliroentgen pocket ionization chambers, 10 of which were placed in pockets sewed onto white duck laboratory coats. These were located on the shoulders, forearms, left breast pocket, right lapel, lower right front pocket, right and left hems, and back of the neck. The physician was requested to wear this coat whenever he used the fluoroscope and to wear his protective apron over the coat if he used one. If any of the pocket meters went off scale, the physician's exposure was monitored for 6 to 8 further weeks by means of film badges.

The dosage rates of the fluoroscopes in the useful beam and also in the radiation produced either by reradiation from the masonite phantom or by leakage in the shielding of the unit were measured for each machine.

The places where the stray radiation was highest were table level of the patient, due to 90° scatter, and the space from the table top to the floor due to 45° scatter from the under side of the table and leakage from the tube housing.

Most of the exposures were low compared with the maximum permissible limits presently recommended. This was not due to protection built into the machines or to good x-ray technique, but rather to the very low work load. More than half of the equipment was used less than one and a half minutes per week. One physician used his fluoroscope less than three and three-quarters minutes per week and received a dose of 81 milliroentgens at the lapel. He would have exceeded the permissible weekly dose substantially if he had used the fluoroscope as much as 15 minutes.

Five of the physicians revealed

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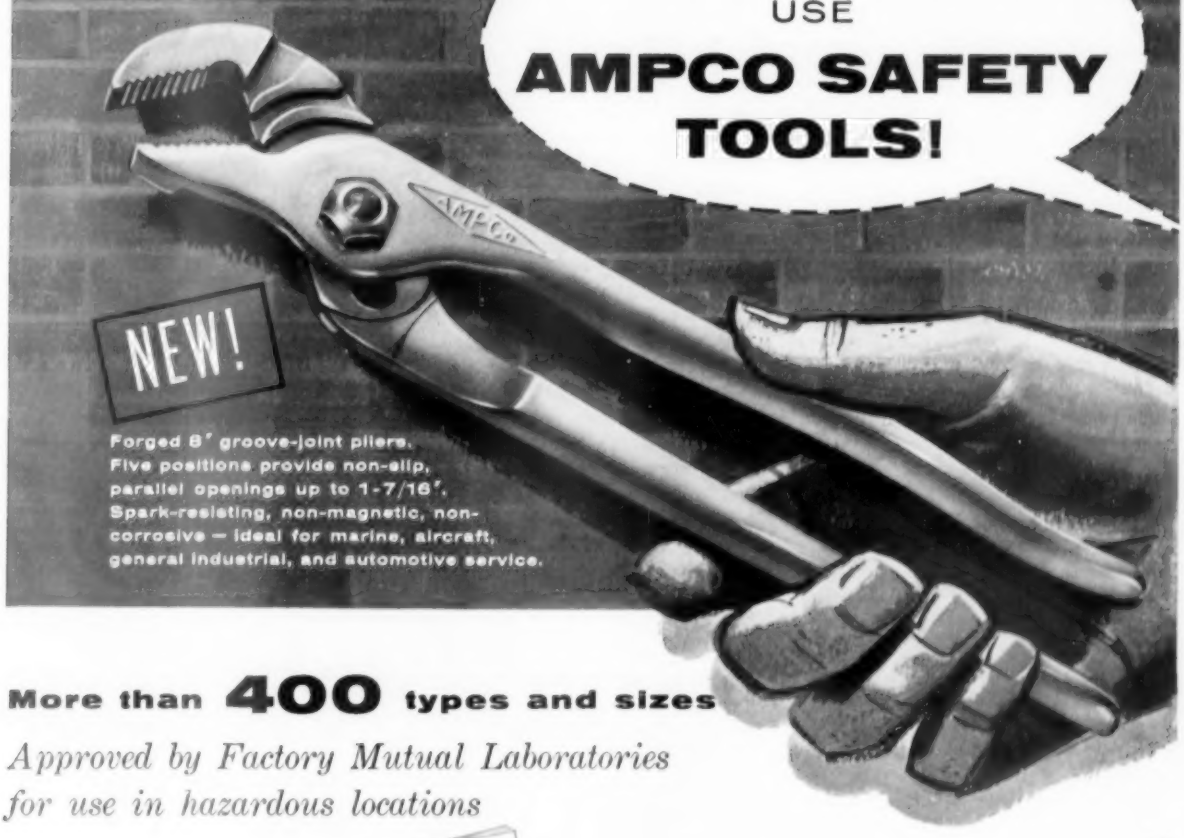

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some evidence of radiation damage to the skin of the hands or feet or to both. Of the men receiving the highest doses three wore no protective garment. One used a hand fluoroscope and one held the child and received relatively high dosages on his hands and arms.

The useful beams in a high proportion of these fluoroscopes exceeded the recommended rate of 10 roentgens per minute. More than half of the physicians did not adapt their eyes to darkness before using the fluoroscope.

The intrinsic shielding of the fluoroscopes left much to be desired, and none had the one-fourth millimeter lead-equivalent curtain hanging between the patient and the fluoroscopist, which is recommended by Natural Bureau of Standards Handbook 60 on x-ray protection. Many of the fluoroscopic tables were provided with a slot for a bucky diaphragm, but the bucky diaphragms were not being used in any instance and the slots were simply openings for the release of stray radiation.

None of the fluoroscopes was provided with a cone extending from the tube-housing to a position near the patient, which is needed to limit the angle of the useful beam, and also to limit the release of stray radiation.

There was a shock hazard of some sort on many of these machines. Over half of the fluoroscopes examined were not grounded. Some had been grounded and the ground connection had been broken and several were grounded in part.

Much remains to be done in both bringing the quality of the equipment up to recommended standards and improving the operations of the physician to the point where they will be working safely.

Damping Vibration

"Materials and Techniques for Damping Vibrating Panels," by Richard N. Hamme. *Noise Control*, Vol. III, No. 2, pages 23-26 and 86 (March 1957).

SINCE extended flat panels are generally the most efficient radiators of noise involved in the design of any machine, and are, therefore, generally more in need of noise suppression than any other part of the machine, the study of effective and economical methods of preventing radiation from panels is likely to be more rewarding than most other things that one can do about noise reduction on machines.

It is still the best engineering procedure to choose the size and nature of the panels for reasons having to do with strength, weight, cost, and the other engineering factors entering into machine design and then to apply the necessary damping to the completed panel to keep its capacity to radiate within predetermined limits.

In most machine design, it is not possible to isolate panels from sources of vibration sufficiently to prevent their vibration, particularly at those frequencies which are natural resonant frequencies of the panel. At the resonant frequencies even quite small influences applied in synchronism with the resonant frequency can build up very high intensities of vibration and correspondingly high noise levels in the surroundings.

As applied to vibrating panels, damping generally means the application to the surface of the panel of materials with a high internal friction which will convert the energy of mechanical vibration into heat. It is possible to damp panels by weighting them so as to change their resonant frequencies drastically but this is ordinarily not helpful in machine design since it will simply move the resonance to a new frequency, which is almost certain to be stimulated by one of the many complex sound frequencies which are commonly produced by machines.

As applied to panels which are commonly used in the construction of machines the fundamental resonant frequencies are ordinarily fairly low. A typical automobile door panel, for instance, showed 4 major resonance peaks and 10 slightly lower resonance peaks in the frequency range between 100 and 600 cycles per second, in addition to a number of substantially smaller resonances. The real effectiveness of damping is seen in the fact that a light damping treatment on a particular panel reduced the sound pressure level at one of its resonance peaks by 20 db., while at frequencies remote from the resonance peaks the sound pressure level reduction was only 1 to 3 db.

Deciding how much damping should be applied to a particular panel is somewhat a matter of

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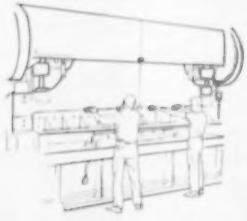

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judgment. There is little advantage in damping the noise production of the panel to below the noise level produced by the rest of the machine since no one could really tell that it had been done. At the same time, the panel must be damped down until the noise level which it contributes is no higher than that of the rest of the machine in order that it shall not be contributing obnoxious noise.

In automotive practice the decision about damping is made on the basis of tests made on quarter-inch-thick steel plates 20 in. square. These plates are suspended at their nodal point so that they will resonate at 160 cycles per second and various materials are added to them in order to determine the damping constant. The effect of given weights of materials on panels of other thickness to weight ratios can then be calculated fairly accurately. The test has to be a fairly highly standardized thing since most damping materials are sensitive to the method of application and the surface density, as well as to the temperature at which the test is applied.

Final test in all cases is, of course, to apply the material to a full size panel and measure what happens under actual operating conditions.

There are certain generalizations which can be drawn from the experimental work. First, for panels of equal mass per unit area more damping will be required for the suppression of low frequency resonances than for the suppression of high frequency ones. Second, for the suppression of resonances of the same frequency more damping will be required for panels of greater mass per unit area.

Where the weight of the damping treatment is of the greatest importance, as in aircraft fuselage panels, the greatest good can be achieved from the minimum weight of damping material by applying it at the point where the vibration of the metal is the most intense. These anti-nodal points can be determined by measurement on the actual panel and the minimal amount of material attached at these points.

Arc-Welding Fumes

"Nitrogen Dioxide and Ozone Concentrations in Welding Operations," by Homer Fay, Peter H. Mohr and P. W. McDaniel. *The American Industrial Hygiene Association Quarterly*, 18:18-28 (March 1957)

CONCENTRATIONS of nitrogen dioxide and ozone produced in arc welding and oxyacetylene gas welding were measured at a variety of positions two feet vertically above and two feet horizontally from the arc on the side opposite the welder, in the welder's helmet or close to his nose in the case of oxyacetylene welding and six inches above the arc. The position six inches above the arc was always in the fume stream from the welding operation.

Welding was done in a small building of about 2,000 cu. ft. which was tightly closed to eliminate natural ventilation and was supplied with no other ventilation. No other welding was carried on in this building while the tests were being made and it was thoroughly ventilated between each series of tests. A few tests were also carried out in a welding shop to make sure that the values found in practical welding were of the same order of magnitude as those found in the experimental work.

Nitrogen dioxide was found in moderate quantities in the fume stream. It was not found in significant quantities inside the welding helmet at any time or at any of the points two feet from the arc except in the fume stream.

It was produced in larger quantities in gas than in electric arc welding. In the gas shielded arc welding, using tungsten electrodes and argon gas for the shielding, nitrogen dioxide concentrations of over 30 parts per million were built up in the position six inches from the arc.

In the gas shielded welding operations ozone concentrations ranging from one one-hundredth part per million to seven-tenths part per million were found. These values are probably maximum, since there seemed to be some interference of nitrogen dioxide with the analytical procedure in the direction of indicating higher ozone.

Ozone concentrations inside the helmet built up quite rapidly with continuous welding. They were generally just at or a little below the recommended maximum allowable concentration of one-tenth part per million after two minutes of continuous welding, but in many instances were far above the maximum allowable concentration after four minutes of continuous welding. There is nothing to indicate that this ozone concentration would persist for very long after the arc was cut off.

The fact that ozone is found in the helmet and nitrogen dioxide was not, probably is due to the production of ozone either in or immediately around the helmet, while nitrogen dioxide is probably produced only in the arc itself or in the fume stream close to the arc.

The ozone concentration found two feet from the arc and in the helmet was often higher than it was six inches from the arc in the fume stream.

These findings seem to indicate pretty much that the recommendations which have been made for a number of years about welding are still desirable. If welding is to be done in small or poorly ventilated spaces mechanical exhaust ventilation should be supplied to move the gases and fumes produced. In large open and unconfined spaces either a good general ventilation naturally supplied or good mechanical ventilation should be enough to keep the concentrations within reasonable bounds.

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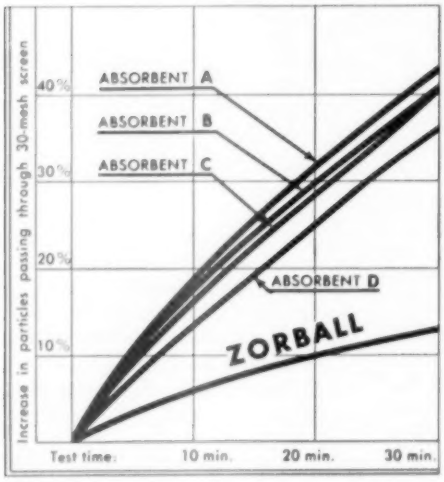

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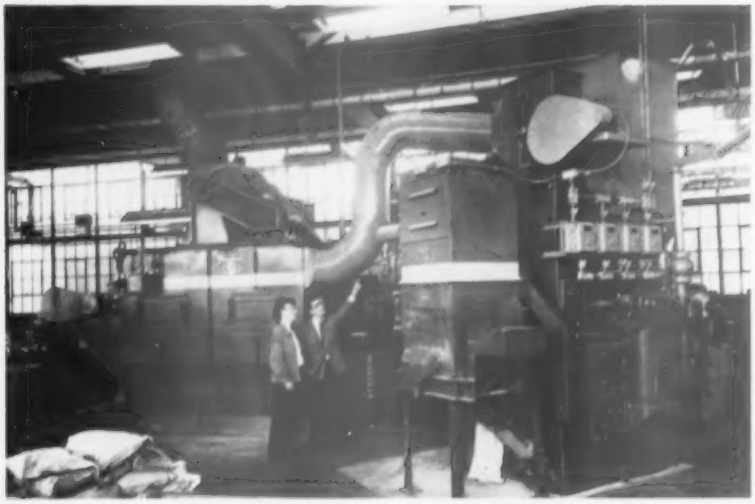

MAGNESIUM FORGINGS are cleaned in airblast table (right). Dust is conveyed to wet collector at left through large round conduit. Sludge is removed by chain conveyor at left end of collector and clean air is exhausted through fan and vertical square duct on top of collector.

MAGNESIUM DUST generated during the airblast cleaning of magnesium forgings was a fire and explosion hazard at Wyman-Gordon Company, Worcester, Mass., that made installation of a wet dust collector imperative.

The firm is a large supplier of aluminum, magnesium, and titanium forgings for the aircraft industry. The collector is a Pangborn Ventrijet.

After the forging operations, the parts are placed on a special airblast table made by the Pangborn Corporation to remove scale preparatory to acid pickling and chrome dipping.

Forgings are placed on one of six revolving auxiliary tables, three to a table. The platform on which the auxiliary tables are mounted also revolves so that the forgings pass under 16 blast nozzles through which is directed aluminum oxide abrasive. The blast cycle is set at 1½ minutes and each forging goes through the cabinet twice to descale both sides. The cleaning rate is 360 pieces per hour.

With the airblast table, one man working one shift equals the production of four men per shift working three shifts per day using hand methods. Uniformity of cleaning is improved.

Magnesium dust created by airblasting in the cabinet, plus abrasive, is drawn into a large settling chamber where much of the abrasive settles out and is returned directly to the blast nozzles. Magnesium dust and fine abrasive then enters the Ventrijet. The dust-laden air is drawn through 12 venturi tubes where it is thoroughly mixed with small particles of water. The mixture of air and dust-laden drops of water are expelled at high velocity from the outlet end of the venturi tubes against impingement surfaces.

The sludge deposited on the impingement surfaces is washed down into the tank and settles to the bottom for removal by a chain conveyor. Drops of water not removed from the air at the impingement plates are deposited on baffles in the water eliminator section and drain back into the tank. Clean air is drawn through the collector outlet for discharge.

The 12-tube Ventrijet at Wyman-Gordon has a capacity of 7,200 cfm. Water is recirculated so that small amounts of replacement water and power are the only operating costs.

Office Hazards

—From page 25

each one of the 12 points where the most common hazards existed, such as the torn place in a rug, the open file drawers, etc.

Another approach is to run colored ribbons from a number of the hazards to a central point appropriately marked. Still another technique may be to include with the exhibit a full list of common hazards generally found in offices.

One agency added interest to its exhibit by offering prizes for the employee listing the greatest number of hazards to be found in it. Entry slips for this contest were judged by a small committee of safety personnel in the agency and through the regular incentive awards program an appropriate prize was provided.

It is recommended that for the greatest educational value the exhibit be designed so that some hazards will be quite obvious while others will require the viewer's close observation and knowledge. The total effect to be created by your exhibit is limited only by your imagination and ingenuity.

Publicity. In undertaking this type of project, be sure to utilize every possible media for publicizing your efforts. Notices should be sent to all employees as well as the general public, and in most cases local newspapers will consider an exhibit sufficiently newsworthy to rate a picture and a story.

Where possible, build your publicity around attendance by not only employees but also top executives. One agency in Washington found it useful to have pictures for release showing the secretary and other staff members personally attending the exhibit.

If there are other safety organizations in the community, you may wish to develop such a project as a joint venture between the field council and the other interested groups.

A sharp tongue severs many a friendship.

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• **We have proved** to our satisfaction that color environment is important to greater plant efficiency and better employee-management relations," comments President Harold M. Cherry. "COLOR DYNAMICS has contributed to higher productivity. Our entire work force takes greater pride in the appearance of our new plant. They help to keep it clean and orderly, reducing housekeeping problems. We consider these benefits a desirable and substantial bonus as they cost us no more than conventional maintenance painting."

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Where formerly it was thought of as just one black instrument, the modern trend is toward a number of telephones at convenient places around the house.

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But the main reason for the success of the idea is that people have found that there is no greater aid to new convenience and comfort than adequate telephone service.

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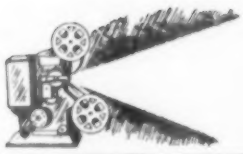


FILM NEWS

By **Nancy Lou Blitzen,** *Public Information Department, NSC*

Four Imps of Accidents

A recently released film on attitude is the United States Steel Company's sponsored production, *Knowing's Not Enough*. This color motion picture runs 28 minutes and was produced for U. S. Steel by Wilding Pictures Productions, Inc.

The story is rather unusual as it correlates an accident that took place during a sports car race with accident prevention in industry. Four friends entered their sports car in a race. Three act as mechanics and the fourth is driver. The driver is seriously injured in an accident which his friends believe they could have prevented because they had noticed certain things wrong with the car before it started, and had also neglected, in some cases, to carefully do their work in servicing it (in their opinion).

When they speak to their foreman about the accident, one of the three men makes mention of the fact that it's too bad that the yellow flag (which is shown after an accident during a race) can't be waved before an accident as a warning that it might happen if something isn't done about a hazardous situation. The foreman correlates this idea with the general attitude towards safety. He says that safety consciousness is like a yellow flag warning before an accident—a known warning that must be heeded.

As the picture progresses, each of the three men has a "yellow flag" experience in which they "see" what might have happened had they not heeded a particular warning—and each of these experiences illustrates three of the four "Imps" of accidents: IMPatience, IMPulsiveness, IMProvise.

They visit the fourth friend (driver who is injured and in the hospital) and he states that the accident was his fault because he knew the car wasn't acting right, but drove on anyway—he illustrated the fourth "Imp"—IMPunity.

The theory behind the story in the film is that the four "Imps" blind us to acknowledging and acting on hazards that we know very well. The "yellow flag" warning is the awareness which dispels the four "Imps."

In some ways, the plot is contrived as the switch from the racing accident to industrial safety is slightly far-fetched and makes the story a bit disconnected in spots. However, the production is far above average as an attitude film.

Prints can be obtained on a loan basis or for purchase from United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

Manual Material Handling

An excellent 35mm color sound slidefilm has been released by Hardware Mutuals. It was produced for them by Vogue-Wright Studios (now no longer making films). *Take It Away* deals with safe and proper ways to lift and carry materials without mechanical aids (materials light enough to carry and move by hand).

Very amusing and clever cartoons illustrate a three-step operation for safely lifting and moving a load from one area to another. The production does a good training job and it is entertaining and interesting as well. It is the type of sound slidefilm which can be favorably compared with the motion picture as a visual training aid. The film runs approximately 9½ minutes.

Prints can be purchased from Dallas-Jones Productions, 1725 N. Wells, Chicago, Ill. Local Hardware Mutuals Agents have prints available on a loan basis, or you may obtain them on that basis by contacting Hardware Mutuals, 200 Strongs Ave., Stevens Point, Wis.

Falling and Bucking Timber

The Pacific Northwest Loggers Assn. and the British Columbia Loggers Assn. sponsored a very fine production on logging safety. Entitled *Falling and Bucking Timber*, it is available in either black and white or color, and runs 20½ minutes. It was produced by Rarig Motion Picture Co.

This production is for both employee and supervisors and stresses safety, planning, supervision, alert workers, and the following of safety rules.

The film covers such factors as conditions of the job which determine the approach to it (method of felling trees, precautions). The principle of safe operation is illustrated through the picturing of several different jobs and how they are completed.

Special hazards are considered as well as the use of special equipment. The special planning and safety precautions involved in the use of such equipment are also covered. The special hazards include felling rotten and dead trees and trees growing on a slope or angle.

Detailed instruction is given regarding angles of cut, clearance, safe use of chain saws and axes. Precautions and actions of the bucker are covered (where he should work, precautions he should take, position of log in area of roll, conditions necessitating special planning).

The last item covered in the film is the use of explosives to remove stumps or fell a tree that cannot otherwise be handled.

The spectacular color photography will hold the audience's interest and the addition of careful handling of detail makes this an excellent safety training film.

Prints are available for rental or purchase from Rarig Motion Picture Co., 5514 University Way, Seattle 5, Wash.

The shortest perceptible unit of time is the difference between the moment the traffic light changes and the boob behind you starts honking his horn.

Operation Safety

Favorable weather and more hours of daylight during the summer months ironically help boost the traffic accident toll. Beginning in May the monthly accident figures rise and stay high throughout the summer months. Increased travel and the greater temptation to speed are two of the factors affecting this rise.

This summer the Operation Safety program is designed to control reckless driving, to warn vacationers of the dangers that lurk on the open road and to urge all drivers to share the road in the broadest sense. In addition to regular program materials, appeals are made to help strengthen and consolidate public support for stepped-up official action in order to curb the accident toll. The individual's driving behavior, the stepped-up enforcement and the rallying of public support are the backbone of the year-long "Back the Attack on Traffic Accidents" program.

In June the theme is "Speed Control," adding emphasis to the annual summer "Slow Down and Live" campaign throughout the nation. The purpose of the program is to point out to the driver that he is speeding whenever he is travelling at a speed too fast for prevailing conditions.

The featured poster of the month carries the message "Speed Control is for Your Protection." The pedestrian poster is an appeal to "Help Kids Stay Alive."

Other program materials include news releases, radio scripts, an editorial, a speech outline and other program aids.

With the coming of summer and the greater urge to drive, both to and from work and during off-hours, this is a good time to step-up your off-the-job safety program. Unfortunately a certain percentage of those who "take to the highway" during the next few months will be "taken from the highway" badly injured or killed. A hard-hitting safety program at your plant or office may save a few employees from that fate.

For information write Operation Safety, National Safety Council, 425 North Michigan Ave., Chicago 11.

* Look to this page each month for latest news about NSC services. Address request for additional information, samples or prices to the Membership Department.

Watch Those Fingers

Your Ten Best Tools, a new Council employee reminder, fixes workers' attention on the fact that their fingers—their 10 best tools—are their wage earners. This handy eight-page booklet shows workers how to protect their hands and keep them out of accident's way.

Many industrial injuries occur when a workman's hands are in the wrong place—when a machine is in motion or when a hand tool slips. And those "10 best tools" can be damaged by dermatitis when the hands are subjected to improper methods of cleansing.

Each year hand injuries cost industry a staggering sum of money, and are often severe enough to affect the victim's ability as a skilled worker as well as his usefulness to the company.

With cartoon illustrations, *Your Ten Best Tools* shows workers how to keep clear of dangerous equipment and avoid pinch points when moving material through tight places or when handling packages. It illustrates the dangerous nip points involved in machinery having turning, shearing or rolling action. It plays up the hazards of dermatitis and shows how to avoid this problem by the use of the proper kinds of cleansing materials.

Fire Equipment Mfrs. Elect Officers

WALTER E. MORGAN, Jr., industrial sales manager for Walter Kidde & Co., was elected president of the Fire Equipment Manufacturers' Association at FEMA's annual meeting in New York on March 19.

Other officers elected were: first vice-president, A. D. Symonds, treasurer of W. D. Allen Manufacturing Co.; second vice-president, Harold A. Strain, sales manager, fire protection equipment, American LaFrance Corp.; and treasurer, Paul Nurkiewicz, vice-president, Stop-Fire, Inc.

In addition to elected officers the board of directors of FEMA include: E. H. Hansen, president, Elkhart Brass Manufacturing Co., Inc.; George F. Clark, vice-president in charge of sales, The General Detroit Corp.; and W. E. Tromanhauser, vice-president and general sales manager, Pyrene-C-O-Two Div., The Fyr-Fyter Co.

There's a bit of Wausau "way down east"
in **NEW ENGLAND**

Wausau Story

by JEROME SULLIVAN
Boston Globe reporter

"Yankee businessmen aren't noted for being talkative. But they opened up to me about the Wausau Story. Wausau, I learned, has come to mean a way of doing business in the insurance field. It all started from a way of life in Wausau, Wisconsin, which is home base for Employers Mutuals. These folks have made the warm, neighborly atmosphere of that town a distinctive brand of business relationship. With the help of a Boston photographer I've tried to capture that Wausau brand image as I found it in New England."

"Historic old First Church in Cambridge, Massachusetts, was organized in 1632. When the present church, erected in 1829, was damaged by a hurricane, the construction company of Donald S. Tait, Inc., was called in. They accomplished the delicate restoration job without changing the original architectural charm or beauty. Mr. Tait (left) told me he gets far more than insurance counseling from his friend, Henry Dennison, New England branch manager for Employers Mutuals, shown here with him. 'Henry's advice was of great help to me in many ways when I was getting my construction business started. His is a business friendship that goes all the way.' I got the impression that this is typical of Employers Mutuals' relationship with policyholders."

"'Old Ironsides' in Boston Harbor forms an historic background for deep sea diver John Simpson as he dons his gear. His employer, 87 year old George M. Bryne (right), heads up the George M. Bryne construction company of Boston, specialists in marine construction and an Employers Mutuals policyholder. Despite the obvious hazards inherent in deep sea diving, Employers Mutuals engineers, in cooperation with the policyholder, were able to work out effective safety controls. A good example, I understand, of Employers Mutuals' knack for studying a problem and then working closely with the policyholder's own staff in helping to reduce accidents—and insurance costs. This seems to be the distinctive 'Wausau way' of doing business."

Employers Mutuals, with offices across the country, writes all lines of fire and casualty insurance. We are one of the largest in the field of workmen's compensation. For further information see your representative (consult telephone directory) or write us in Wausau, Wisconsin.

Employers Mutuals *of* Wausau

"Good people to do business with"

For Every Tankcar Loading or Unloading Situation A NECO SAFETY PLATFORM

OUTSIDE

Handling vinyl acetate monomer at Air Reduction Chemical Company, Calvert City, Kentucky. This NECO 2A platform can be turned manually — has retractable deck and stainless steel piping, automatic foot brake and explosion proof lighting fixtures.

INSIDE

Unloading liquified paraffin at Kalamazoo Vegetable Parchment Company, Kalamazoo, Michigan. This NECO 3NT platform can be raised or lowered hydraulically—fits narrow clearance conditions.

ALL AROUND

Unloading diesel fuel at Chesapeake and Ohio Railway, Detroit, Mich. Shows orderly arrangement of several NECO 2A Safety Tankcar Platforms.

For greater safety, higher morale and more efficient loading and unloading of any type of liquids — let the Nichols Safety Tankcar Platform serve your company. Get full details today.

NICHOLS ENGINEERING CO.

3816 W. GRAND AVE., CHICAGO 51, ILLINOIS

SERVING INDUSTRY SINCE 1894

Wire from Washington

—From page 17

system will decrease the system's safety . . . " The Federal Highway Administrator testified that such billboards would be "highly detrimental" to the safe movement of high-speed traffic, because of their distracting effect.

Congressional interest continues high in measures to deal with traffic safety. H.J. Res. 297 would establish a Federal Motor Vehicle Commission, for uniform laws for the operation, ownership and control of motor vehicles. H.C.Res. 26 would express the sense of Congress concerning the establishment of uniform traffic laws throughout the United States. Senator Wiley expressed regret that only seven states require a visual examination when they renew their operators licenses.

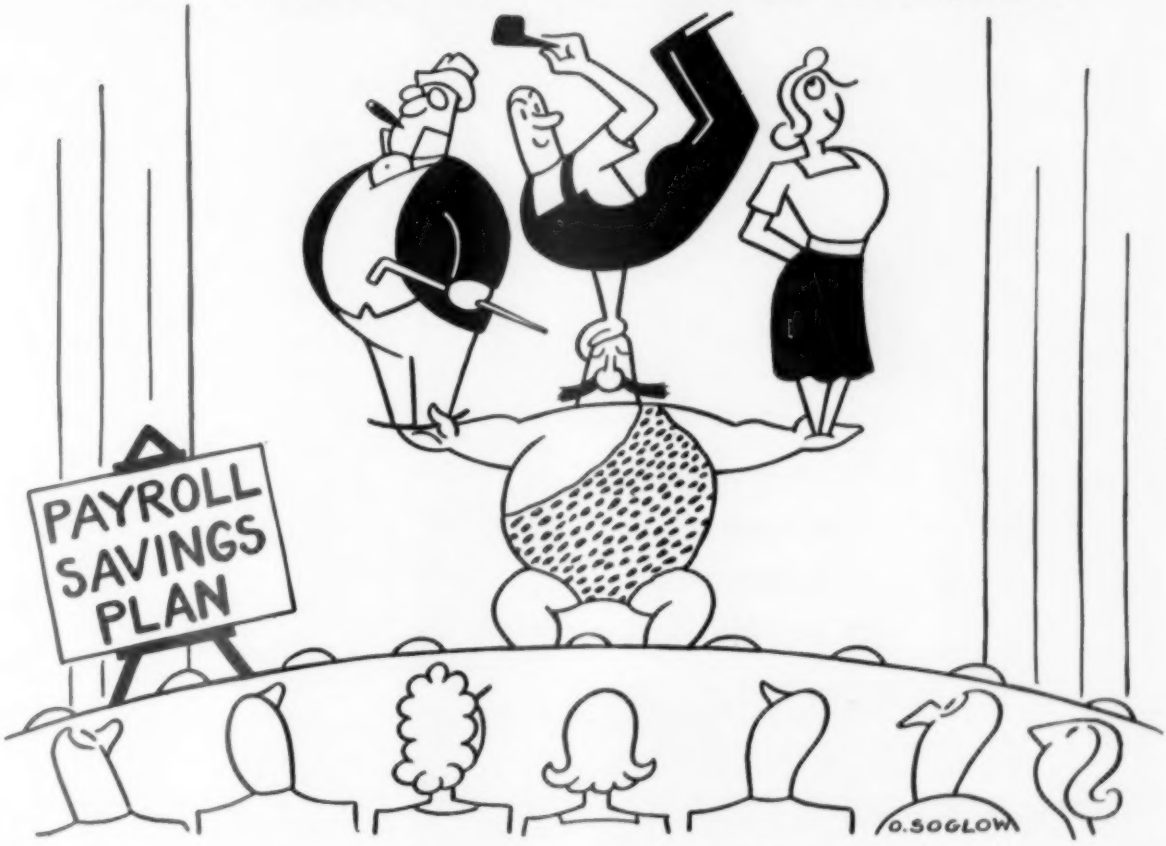
Aviation Safety. A Senate committee heard testimony from the president's special assistant for aviation, proposing legislation to create an independent Airways Modernization Board, as part of a plan for improving the safety and efficiency of the nation's airways. The president sent to Congress a special message urging adoption of such legislation and asking early action.

The Senate adopted S.Res. 87, favoring regulation of aircraft flights over urban areas. The CAA announced that, as part of a three-step plan, it will control all airspace over 24,000 feet, a step which trebles the square mileage of controlled airspace.

The CAB announced the results of a study which showed that in the last 4 months of 1956 it had received reports of 452 near-collisions from civil and military planes. This was a daily average of 3.7 near-misses. Fifty-five per cent of the planes reporting were civilian planes, the rest military.

Maritime Safety. The House Committee on Merchant Marine and Fisheries completed its study of recreational boating safety. There are some six million pleasure boats in operation today. The Committee's chairman expressed the belief that it was Congress's responsibility to enact model

"Got A Load On Your Mind? I Haven't"



Nothing gives employees a more luxurious, satisfied feeling than that of financial security. And nothing is easier for them to achieve when you provide the convenience of automatic Payroll Savings Plan.

EVERYBODY BENEFITS

Security breeds confidence—and confidence stimulates job interest and results in steadier people who are far more efficient in their work. Receiving those crisp Bonds at regular intervals along with their paycheck is an added inducement for employees to stay on the job.

Moreover, when you install the Payroll Savings Plan in your company, you promote not only the security of your personnel but the security of your company and your country. Over forty million Americans have over 40 billion dollars invested in United States Savings Bonds—a backlog of purchasing power for the future.

EASY TO INSTALL

If your company does not now have a Payroll Savings Plan, or if employee participation is less than 50%, a letter to: Savings Bonds Division, U.S. Treasury Department, Washington, D. C. will bring prompt assistance from your State Director. He will provide application cards, promotional material, and as much personal help as you need.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

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raw materials...
consider the
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can help you lower cost
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But if that material
is a flammable liquid,
be sure your program
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for helpful recommendations!
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The only company exclusively engaged in the design, development and manufacture of foam fire protection equipment and chemicals.

federal laws applicable to the navigable waters over which the Coast Guard has jurisdiction, in the hopes that such model legislation would bring about uniformity of boating laws throughout the country.

Farm Safety. Calling attention to the fact that "the death toll from farm-work accidents last year was higher than in any other major industry," and to the need for safety education to cope with this problem, the president issued a proclamation setting aside the week beginning July 21, 1957 as National Farm Safety Week.

Home Safety. The Senate passed S. 1747, to provide for the compulsory inspection by the U. S. Department of Agriculture of poultry and poultry products, to assure their wholesomeness, the maintenance of sanitary facilities and practices, and correct labelling.

A House subcommittee held hearings on H.R. 503 to regulate the manufacture and distribution of barbituate drugs.

The administration recommended legislation to require the testing of chemical additives prior to their use in foods. The proposal would require manufacturers of food products to show proof to the Food and Drug Administration that the chemicals are safe for human use. Under present law, the burden of proof is on the FDA to prove that the additives are unsafe.

The Secretary of Health, Education and Welfare said that "present controls do not assure adequate public protection" and that "many" of the chemical additives have not been subjected to adequate scientific investigation to determine their safety.

Voice of the Reader

—From page 8

So from Heinrich to Brookshire, regardless of the subject about which the individual authors have written, the underlying enthusiasm was the "bell-ringer" in each case.

—Ray Hall, *Accident Prevention Engineer, E. H. Blue & Associates*

Athlete's Foot

SAN FRANCISCO. I would like to register a complaint about your March Safety Equipment issue.

On page 122 where you discuss fungus infections, you were kind enough to give us a pat on the back by saying: "Preparations for toughening the skin increase resistance to fungi." But this sentence is immediately followed by this paragraph:

"Pans of antiseptic solution have been found ineffective or worse. A better method uses a device which dispenses a fresh solution over the feet when the shower user steps on the grating."

That is very misleading. It definitely gives the implication that the important consideration of an athlete's foot preventive is the method of dispensing the solution, rather than the nature of the solution itself.

Dr. Louis Schwartz, formerly chief of the Office of Dermatology, Industrial Hygiene Division, U. S. Public Health Service, has stated that disinfectants, whether applied in tubs, mats, or in spray devices, are of no value in the prevention of athlete's foot.

In other words, the thing that was found "ineffective or worse" was not the pan but rather an antiseptic solution that relied solely on killing the germs.

You are doing us and the general field of safety a great disservice for two reasons: (1) The wording of the above paragraph will cause a lot of people to think that an Onox footmat is a pan of antiseptic solution. (2) Worse still, it will cause a lot of people to think that a spray device dispensing a disinfectant is better than a footmat.

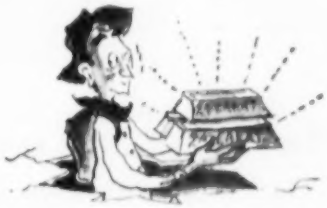
The best skin specialists in the country have repeatedly pointed out that the only logical method of preventing athlete's foot is to use a fungistat that has a drying action on the skin. The method of dispensing such a solution is not important. It is the solution that does the work.

—ROBERT DE FREMERY, Vice-President, Onox, Inc.

A woman will stop to look in a mirror anytime except when she is pulling out of a parking place.

Mr. Purdy discovered a Gold Mine ...in his *floors*

Prospecting for a way to cut overhead, Mr. Purdy looked underfoot. He found his Floor Maintenance was costing him a fortune.



As so many executives of industrial, hospital and office buildings have done, he dumped the problem in the lap of a LEGGE Safety Floor Specialist.

The LEGGE Man immediately put a half-Nelson on the labor and material costs that were draining Mr. Purdy's resources. He instituted a sensible program of daily housekeeping that eliminated expensive waste motion. And, since LEGGE Polishes rarely need to be taken up, he virtually ended the costly cycle of stripping and re-polishing.

"It's a Bonanza!" clucked Mr. Purdy. "I've cut maintenance costs by one-third. And LEGGE Safety Polishes have reduced slip-accidents, so I'm paying a lower rate on my liability insurance. I've struck it rich!"

Question: At a normal profit, how much *extra* business would you have to do in order to clear $5,000? LEGGE Maintenance may save you 2 or 3 times that much, depending upon the size of your building. Send for our Free Floor Care booklet today. It will help you find the Gold in your floors.

WALTER G. LEGGE CO., INC.

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☐ O. K. Show me how LEGGE can save me money.
☐ Send Free booklet on conductive floor maintenance.

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want quality slings?

The slings you use have to be the best. There's too much at stake—the safety of your crew, your equipment and the material they're handling. How can you make sure that the slings you have are the best available? Ask your supplier these questions:

Does the maker produce his own steel?

Then does he carefully test the results?

Does he process this superior steel into top-quality wire?

Then does he carefully test the results?

Does he make this superior wire into top-quality wire rope?

Then does he carefully test the results?

Does he fabricate this superior wire rope into top-quality slings?

Then does he carefully test the results?

If you receive even a single "no", it'll pay you to get the Wickwire story . . . to see how Wickwire Wire Rope Slings are made—from blast furnace to testing of the completed sling—by a *single* company with over a century and a quarter of wire-making experience. Contact the nearest sales office below today.

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WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.)
New Orleans • New York • Philadelphia • CF&I OFFICES IN CANADA: Toronto • Montreal

Arctic Circle

—*From page 100*

Safety Council "Award of Honor."

1953—Northeast District received Department of the Army "Award of Merit."

1954—Division received Department of the Army "Award of Merit."

1955—Division received National Safety Council 1st Place Award for Truck Operation.

1955—Drake-Merritt, contractor at Goose Bay, Labrador, won National Safety Council "Award of Honor" and Associated General Contractors Award.

However, when you get a report, such as the one on my desk now, stating that a 22-year-old boy drowned because he was not wearing a lifevest and, when you read further and find that a five-dollar deposit was required by the company on lifevests, you begin to wonder if anything at all has been accomplished in 20 years. This statement was a shocking surprise, but the report created absolute amazement when it went on to claim that such a deposit would make the men more safety-conscious.

All safety engineers can recall numerous instances where lives were saved through use of lifevests, but right now I believe all of us can only think of a youngster who lost his life for a very foolish reason.

Esso Sets Up Highway Traffic Unit

Esso Standard Oil Company will devote increased attention to long-range studies and programs in the fields of traffic safety and highway development, according to Stanley C. Hope, Esso president. A new Highway Traffic Department of the company is being established to coordinate these activities.

Sponsorship of highway-safety research, education, enforcement and engineering projects will be a major part of the over-all program, according to Mr. Hope. These will be carried out by the Esso Safety Foundation, which

will be under the supervision of the Highway Traffic Department.

John J. Hall has been named manager of the new department, and Harry J. Green has been named assistant manager.

Mr. Hall is also director of the Esso Safety Foundation. The foundation was reactivated by Esso Standard in 1954, and Mr. Hall was appointed its director, shortly after the White House Conference on Highway Safety prompted increased activity in this field.

One of the organizers of the American Association of Motor Vehicle Administrators, Mr. Hall is the association's only honorary member. He is also a charter member of the National Conference on Street and Highway Safety, and a member of the Advisory Committee of the Center for Safety Education at New York University, and of the Citizens' Traffic Safety Board of New York City.

Mr. Green, a former district sales manager for Esso Standard at Albany, has been a member of the firm's New York Public Relations Department for more than a year. He was public-relations representative for the New York Sales Division of Esso Standard from 1953 through 1955.

Functions of its new Highway Traffic Department, Esso Standard reported, will include studies of the development of the interstate and other Federal-aid highway systems and the effects of such new roads on population and business, petroleum-industry operations and traffic safety.

The department will work closely with a new Highway Development Committee organized by Esso Standard early this year, which includes representatives from Standard Oil Company (N. J.), parent company of Esso Standard, and other affiliated companies. Mr. Hope is serving as temporary chairman of this committee.

The difference between a pessimist and an optimist is that if you fall in a deep hole, an optimist will pull you out, but a pessimist will get in with you.

New safety garments help Lukens Steel condition 3 million tons of steel without a disabling injury!

Mr. Frank Bird, supervisor of safety & plant protection, and Paul Lake, General Foreman—Steel Conditioning Yards, Lukens Steel Company, Coatesville, Pa.

3M Brand Aluminized Fabric cuts lost worktime . . . boosts production!

You can profit from Frank Bird's experience at Lukens Steel! The Scarfing Department of their Steel Conditioning Yard had a two-fold problem: to protect the men from accidents and cut down costly lost worktime.

Working closely with Mr. Lake, Mr. Bird outfitted every man with new 3M Brand ALUMINIZED FABRIC safety garments. The amazing contribution made by these garments is told above. Three million tons . . . without a single disabling injury in 2,229 days.

Why don't you do as Lukens Steel did, and look into 3M Brand ALUMINIZED FABRIC. For this is the new material in safety garments that allows work in the vicinity of 3000° F. exposures . . . reflects 90% of radiated heat . . . protects against metal splash . . . lasts more than twice as long as old-style, heavier garments. Men like to wear it, too. 3M ALUMINIZED FABRIC safety garments are light, comfortable, flexible . . . efficient to work in. Full line available . . . coats, aprons, gloves, etc.

Send the coupon below for full details.

3M Brand Aluminized Fabric Garments are available from leading safety clothing manufacturers.

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ALUMINIZED FABRIC

The term "3M" is a registered trademark of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. General Export: 99 Park Avenue, New York 16, N. Y. In Canada: P.O. Box 757, London, Ontario.

Minnesota Mining and Manufacturing Co.
Dept. NK-57, St. Paul 6, Minn.

Please send complete details and free sample of new "3M" Brand Aluminized Fabric.

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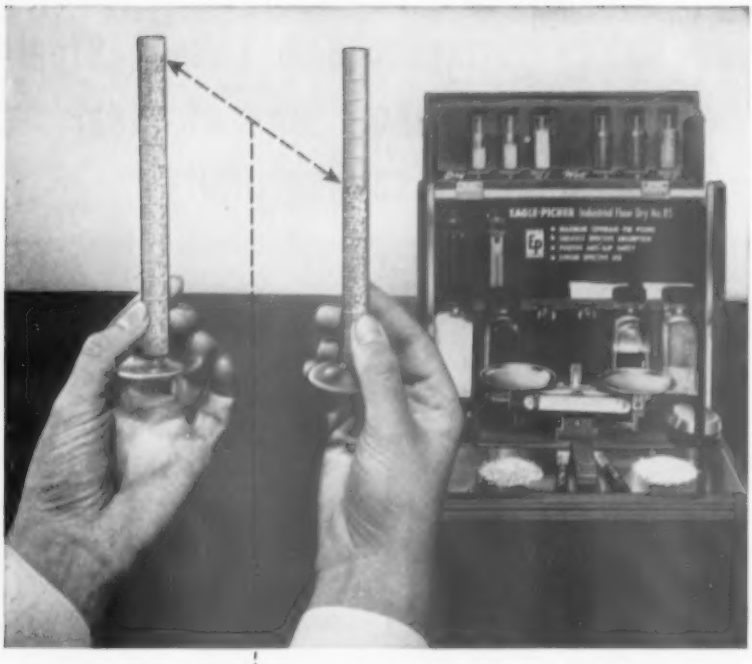


There's a BIG difference in floor absorbents

TEST IT Yourself!

IN YOUR OWN OFFICE, make this simple 15-minute test. Compare Eagle-Picher Industrial Floor-Dry to any other floor absorbent.

HERE'S WHAT YOU'LL PROVE TO YOURSELF about safe, skid-proof Eagle-Picher Floor-Dry: It's extremely insoluble, absorbs more oil and water. It goes further, provides much greater coverage. It reflects more light, brightens the work area. It's non-combustible, has no chemical reaction. It lasts longer, saves you money!

Since 1843 EAGLE EP PICHER

WRITE TODAY. Our Eagle-Picher representative will bring the portable laboratory to your office where you may make this test yourself. The Eagle-Picher Company, Cincinnati 1, Ohio.

Ladder Code

—From page 62

sign of fixed ladders. For instance, the following appears under the heading "Design Considerations:"

"All ladders, appurtenances, and fastenings shall be designed to meet the following load requirements:

1. The minimum design live load shall be a single concentrated load of 200 lbs.
2. The number and position of additional concentrated live load units of 200 lbs. each as determined from anticipated usage of the ladder shall be considered in the design.
3. The live loads imposed by persons occupying the ladder shall be considered to be concentrated at such point or points as will cause the maximum stress in the structural member being considered.
4. The weight of the ladder and attached appurtenances together with the live load shall be considered in the design of rails and fastenings."

The committee hopes that all concerned will help bring about wider use of the new standard. It suggests that safety engineers, for example, urge their local safety councils to publicize the existence of the code and urge them to bring any pressure to bear that might lead to adoption of this code as a state code.

The committee also suggests that the subject of fixed ladders, including discussions of the new code, is suitable for discussion at a future meeting of the local chapter of the engineering society. It asks that those concerned with safety gather statistics on fixed ladder accidents in the area or in the company, that they take pictures of ladders without page or basket guards, and that they use this information for discussion to help bring about greater compliance with the code.

The committee believes that promotion of this standard by associations and other groups will do much to recommend its use and adoption in the various states.

The one book that really tells you where to spend your vacation is your checkbook.

Radioactive Wastes

—*From page 37*

An outstanding feature of air- could not be met by available dust-control equipment.

This situation was met by a research and development program that encompassed fundamental studies on the characteristics and behavior of aerosols, design of specialized equipment, and evaluation of the dispersion of these materials into the atmosphere. As a result, such air-cleaning units as high-efficiency filters capable routinely of removing 99.5 per cent of particles 0.3 microns in diameter were developed and put into commercial production.

Also, information was, and is being, obtained on the characteristics of aerosols to serve as a sound basis for improved assessment of gaseous waste problems and continued development of air-cleaning equipment.

For the most part, handling and disposal of gaseous wastes from nuclear facilities is amenable to practical engineering control.

Solid radioactive wastes, such as non-usable contaminated equipment, non-recoverable scrap, and contaminated trash which are produced in all operations, do not constitute a serious technical problem. However, if inadequate provisions are made for their handling and disposal they could be a distinct nuisance and—even a hazard.

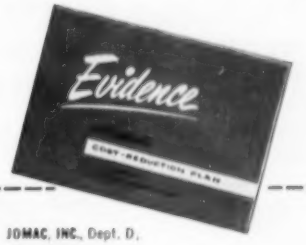
Levels of radioactivity associ-

"But, Boss, I wasn't jaywalking! The raise you gave me rolled out into the street and I went after it!"

GLOVE COSTS too high?

Lower them . . . with the JOMAC COST-REDUCTION PLAN

Many large industrial glove users have found this plan gets results. Send for the free booklet illustrated. It describes the plan and gives striking evidence of its success.



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INDUSTRIAL GLOVES

Plants in Philadelphia, Pa., and Warsaw, Ind.
In Canada: Safety Supply Company, Toronto
In Europe: North-Jomac Ltd., London, W1

JOMAC, INC., Dept. D,
Phila. 38, Pa.

☐ Send me a copy of your "Evidence" Booklet

☐ Have your representative call

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StaSafe Pocket Paks contain six enteric coated salt tablets sealed in plastic for absolute cleanliness. Slip your Pocket Pak into a shirt pocket and carry your own private salt tablet supply.

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ated with solid wastes may vary from a few times background to quantities requiring substantial shielding or remote handling. The engineering of systems for handling and disposal of solid wastes has been relatively simple. Burial of such wastes under known, controlled conditions and, in specific instances, disposal at sea have successfully handled the problem.

Established burial grounds for solid radioactive wastes exist only at large atomic energy production and development sites such as Oak Ridge, Idaho, Savannah River, Hanford and Los Alamos. These facilities are in isolated areas with detailed geology and hydrology generally favorable to burial ground location.

Within AEC, the operating establishments, other than those noted above, usually consist of relatively small areas and are in or near densely populated sections with perhaps less favorable geology and hydrology. In these cases the general procedure is to ship wastes to one of the established burial grounds.

In this latter connection we are confronted with the problem of locating other suitable burial grounds. This situation is most pressing in the Northeastern United States where, at present, the only available disposal sites are Oak Ridge and the Atlantic Ocean. It is generally felt that solid waste disposal facilities should not be indiscriminately scattered around the country. (The proposed AEC regulations on standards for protection against radiation do permit "on-site" burial of very small quantities of radioactivity.

Accordingly, AEC staff is now engaged in investigations directed toward the possibility of establishing a solid waste-handling and disposal facility to service the Northeastern U. S.

To date, relatively small quantities of radioactivity, with the major contributions coming from Brookhaven National Laboratory, Bettis Field, and the University of California Radiation Laboratory, have been disposed of at sea. In these instances this has been a safe, practical method of disposal. However, among other

things, costs of sea disposal operations, including shipping to port, etc., appear to preclude widespread use of this method.

Incineration of combustible, solid wastes to reduce volume and facilitate ultimate disposal has been practiced to a limited extent. The engineering and economic advantages of incineration over other approaches, including compressing, baling and direct burial, have not been demonstrated but concentration by burning may be practical in specific circumstances. A special unit to burn 30 lbs. per hour has been developed by the U. S. Bureau of Mines and is now being put into operation at the Harvard Air Cleaning Laboratory in connection with final development of a suitable air cleaning component.

Where quantities of activity associated with solid wastes are low, the use of a "solid dilution" approach—disposal into a municipal or institutional incinerator—may be acceptable. This problem is now being considered by a special sub-committee of the National Committee on Radiation Protection of the U. S. Bureau of Standards. An NBS Handbook on this subject is the objective of this sub-committee.

Liquid radioactive wastes are evolved in all nuclear energy operations from laboratory research to full-scale production. As previously indicated, it is important to differentiate between what we call a "high-volume, low-level" waste, for example, the contaminated laundry waste which may contain say a few microcuries of radioactivity per gallon; and a "low-volume, high-level" waste resulting from chemical processing of nuclear reactor fuels which may contain up to 1,800 or more curies per gallon. The engineering problems of these two categories are entirely different.

Liquid wastes with low concentrations of radioactivity originate in laboratory operations where relatively small quantities of radioactive materials are involved, ore and feed material processing, the normal operation of essentially all reactors, particularly water-cooled types, and the routine operation of chemical proc-

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essing plants. These low activity wastes, under proper environmental conditions, are susceptible to either direct disposal to nature or to disposal following minimum treatment.

Treatment processes include co-precipitation, ion-exchange, biological systems similar to sewage treatment methods and others. Because of their relatively high volume (millions of gallons per day) total costs may be substantial. Therefore, to the extent that it is absolutely safe, maximum use is made of dilution factors available in the environment. This points up the importance of proper site-selection and quantitative data concerning the environment.

High-activity liquid wastes associated with the chemical processing of reactor fuels, as already indicated, constitute the bulk of the engineering problem of disposal. It should be pointed out clearly that these wastes do not come directly from the reactors themselves, although under the improbable conditions of reactor malfunction some high-activity waste material may result.

In the future such wastes also may be associated with certain types of homogeneous reactor sites to the extent that continuous fuel processing right at the reactor is envisaged. At present, however, chemical processing plants are essentially the sole source of the wastes. Production scale chemical plants are presently located at Savannah River, Hanford and Idaho.

Chemical processing of reactor fuels is done to recover unfissioned or unburned fuel from the desired product and the wastes. At present, this means, for the most part, separating uranium, plutonium and fission products. The fission products which constitute the "hot" component of the wastes are radioactive elements ranging in mass number from 70 to 162. From an environmental standpoint the more troublesome of these elements include strontium, cesium and others in the rare earth series. In the solid fuel element prior to separation (generally an aqueous chemical process) the concentration of fission products ranges from 100 to perhaps 1,000 ppm.

In the course of processing, the fission product concentration is considerably diluted by solvents, water and other solids. The resulting liquid wastes streams are, therefore, quite dilute as far as mass concentration of fission products is concerned. However, as previously stated, because of the high specific activity of these elements, these wastes may contain quantities of radioactivity up to several hundreds of curies per gallon. The effective life of this radioactivity may be measured in hundreds of years. These wastes also may generate heat to the extent of 10 to 50 Btu per gallon per hour.

The quantity of high-level wastes generated depends largely on the chemical and metallurgical characteristics of the fuel being processed and the specific nature of the chemical process involved. It may range from 0.1 gallons to 5.0 gallons per gram of uranium

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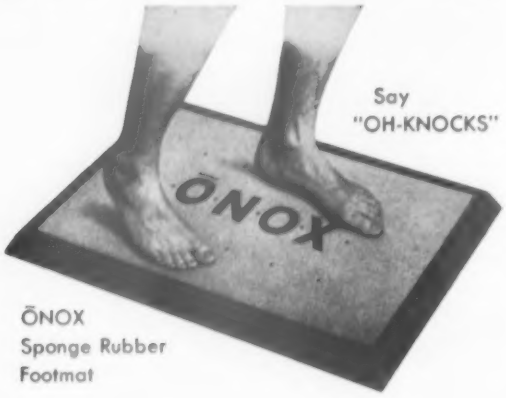

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processed. On a total volume basis we have to consider waste production rates of tens of millions of gallons per year

From the viewpoint of the sanitary engineer, it is perhaps misleading to apply the term "disposal" to current methods of handling highly radioactive liquid wastes. With only minor exceptions these wastes are not "disposed of" but are stored in specially designed tanks. Since the effective life of the fission products constituting the wastes may be hundreds of years, it is apparent that tank storage is not a permanent answer. Capital cost of tank storage varies from about 30c to $2 per gallon capacity.

What, then, are the possibilities for disposing of high-level wastes? First, based on various estimates on the growth of nuclear energy in this country one can calculate the total cumulative quantity of radioactivity to be disposed of at given times in the future. Now, when one considers the generally extremely low maximum permissible concentrations of radioactivity in air and water it becomes apparent that, there is not enough dilution available in nature to enable any practical, continuing dispersal of these wastes into the environment.

"Saves explaining."

A possible exception, but somewhat academic at present, is disposal at sea.[2] Some oceanographers have indicated that, based on general knowledge of the behavior of the ocean deeps (12,000 to 15,000 ft. depths) and marine biology, it appears that substantial quantities of radioactivity may be disposed at these depths safely.

They also indicate that much detailed oceanographic work is required before actual sea disposal criteria could be established. This lack of information coupled with complete loss of control of the material once it is disposed, the complex engineering problems and high costs leads one to the conclusion that sea disposal is probably a secondary possibility at this time.

Practical Approaches

Several practical approaches to ultimate, safe disposal of high-level wastes appear possible.[3] These are described briefly below. Work on these approaches is being carried out at a number of AEC installations.

1. Fixation in inert media. The

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objective is to fix the radioactive waste material (actual fission products) in an inert solid carrier so that the possibility of migration of the radioactivity into the environment is eliminated or reduced to acceptable limits. The carrier containing the radioactive material could then be permanently stored or buried in selected locations without deleterious effect on man or his environment.

2. Separation of specific isotopes.

3. Direct discharge to selected geologic formations. It may be practical to dispose of untreated wastes underground into such formations as:

a. Spaces prepared by dissolution in salt beds or salt domes.

b. Deep basins (5,000 to 15,000 ft. in depth) containing connate brines and with no connection to potable waters or other valuable natural resources.

c. Special excavations in selected shale formations.

A number of engineering problems must be solved before such installations will be practicable. Providing equipment which will withstand highly corrosive media, control highly active aerosols which are evolved, and which can be operated remotely with minimum maintenance is no small order. Progress is being made, however.

One aspect of the over-all subject of waste disposal is site-selection for nuclear energy facilities.

Specific note must also be made of the administrative aspects of the industry, including control, regulations and public relations.

Changing technology is a characteristic of the nuclear energy business. New reactors, new fuel elements, new chemical processes, and new uses of radiation may have a profound effect on the waste problem. In the future it will perhaps become even more important to maintain a close working relationship between the nuclear engineer, the chemical engineer, the sanitary engineer and the environmentalist.

To my knowledge, no other industry has faced the diverse in waste disposal that is in front of the nuclear energy industry. But we who are working on this fascinating and challenging problem look forward to the future of our industry with courage and confidence.

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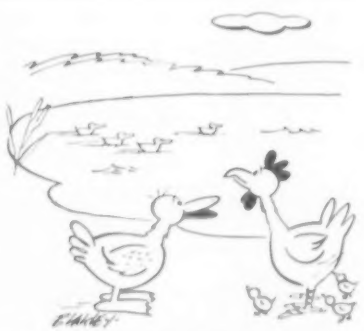

"You'll feel so much more at ease if you teach your chicks to swim."

National Committee Names Safety Film Winners

NINE MOTION PICTURE films have been named as the outstanding accident prevention films produced in 1956. In addition, certificates of merit were awarded to nine motion pictures and one sound slide film.

Winners were selected by the National Committee on Films for Safety. This committee, which represents 24 national organizations, makes annual awards for safety films in the fields of occupational, traffic, home, and general safety.

Film entries are judged on the basis of technical accuracy, effectiveness of intended message, audience appeal, and quality of photography and sound.

Entries are accepted from sponsors and producers of theatrical (35mm) and non theatrical (16mm) motion pictures, or sound slide films.

Chairman of the committee is John B. McCullough of the Motion Picture Association of America; the secretary is William Englander, National Safety Council.

Other member organizations are as follows:

American Association of Motor Vehicle Administrators
American Automobile Association
American National Red Cross
American Public Health Association
American Society of Safety Engineers
American Standards Association
Association of Casualty and Surety Companies
Association of Safety Council Executives
Automotive Safety Foundation
Council on Industrial Health (American Medical Assn.)
Inter-industry Highway Safety Committee
International Association of Chiefs of Police
National Association of Automotive Mutual Insurance Companies
National Association of Manufacturers
National Association of Mutual Casualty Companies
National Fire Protection Association
National Retail Farm Equipment Association
U. S. Bureau of Public Roads
U. S. Department of Air Force
U. S. Department of Army
U. S. Department of Navy
U. S. Junior Chamber of Commerce

Following are the 1956 winners of plaques and certificates:

OCCUPATIONAL

Motion Pictures—Non-Theatrical

PLAQUE

Falling and Bucking Timber, produced by Rarig Motion Picture Co. for Pacific Northwest Loggers Assn.

First Aid for Aircrew, produced by National Film Board of Canada for Department of National Defense (Air).

Knowing's Not Enough, produced by Wilding Picture Productions, Inc. for United States Steel Corp.

AWARD OF MERIT CERTIFICATE

Balance in Action, produced by Varifilms.

The First Five Minutes, produced by Audio Productions, Inc. for National Board of Fire Underwriters.

No One Else Can Do It, produced by Sarra, Inc. for National Safety Council.

Safety Doesn't Happen, produced

It need not have happened!
"Watchman Failure" noted on many official reports of weekend fires—is a tragic reminder that many disasters need not have happened. An alert watchman can do more good fighting a fire the first five minutes than the fireman can the next five hours.
The Detex Guardsman gives you unbroken mechanical supervision of your watchman on week days, weekends and holidays. Like a mechanical conscience, the Guardsman keeps him alert. Write for the vital facts.
FREE INSPECTION
Is your watchman's tour giving you maximum protection in light of recent plant expansion? Are your clocks adequate for the job? Are your register keys in good order, the station box screws properly sealed? It won't cost you anything to find out. Our inspector will be glad to make a free analysis to see that you are getting the protection you are paying for. Write or telephone for appointment.
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by Vogue-Wright Studios for National Safety Council.

Soundslide

AWARD OF MERIT CERTIFICATE

Take It Away, produced by Vogue-Wright Studios for Hardware Mutuals.

TRAFFIC AND TRANSPORTATION

Motion Pictures—Non-Theatrical

PLAQUE

I'm No Fool as a Pedestrian, produced by M.P.O. Productions, Inc. for Ford Motor Co.

Traffic Action Program, produced by Apex Film Corp. for President's Committee for Traffic Safety.

The Two Sleeping Lions, produced by AAA Public Relations for AAA Foundation for Traffic Safety.

AWARD OF MERIT CERTIFICATE

Freedom of the American Road, produced by M.P.O. Productions, Inc. for Ford Motor Co.

GENERAL

Motion Pictures—Non-Theatrical

PLAQUE

Go to Blazes, produced by National Film Board of Canada.

Trains, Tracks and Safety Facts, produced by Unifilms, Inc. for Pennsylvania Railroad.

AWARD OF MERIT CERTIFICATE

Album of Public Safety, produced by Washington Video Productions for Underwriters' Laboratories, Inc.

Blasting Cap, produced by Pennsylvania Film Productions, Inc. for Institute of Makers of Explosives.

Common Sense Afloat, produced by United States Coast Guard.

Theatrical Motion Pictures

PLAQUE

How to Have an Accident in the Home, produced by Walt Disney Productions.

Theatrical Trailers

AWARD OF MERIT CERTIFICATE

Traffic Safety Series, produced by United Film Service, Inc.

What happens to plant safety when the lights go out?

(the true story of a needless accident)

"Suddenly the lights went out. We had lost our electric power. Then a cry of pain filled the air. Bill Dunlap, our best machinist, had tripped over a piece of bar stock in the dark. He was on the invalid list for over 2 weeks."

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NSC, Boy Scouts Team Up For Safety in 1958

THE BOY SCOUTS of America have announced that the Scout national service project for 1958 will be designed to promote safety. The program, "National Safety Good Turn—1958," is being planned in cooperation with the National Safety Council.

The purpose of the campaign is to interest the youth of America in safety, and through them to reduce the toll of accidental deaths and injuries. Members of the Boy Scouts, by planning and carrying out specific individual, group, and community safety projects, will cooperate with public officials and all those now interested in the accident prevention movement.

The project is also designed to intensify the safety part of the Boy Scout program and to help prevent accidents by teaching proper attitudes and objectives.

This national service project will be divided into four phases: Traffic will be emphasized in March, April, and May; outdoor safety in June, July, and August; home safety in September, October, and November, and winter and holiday safety in December.

The National Safety Council has reviewed plans for the program and commends it as an activity likely to make a significant contribution to safety in America.

Selling to U.S.

—*From page 19*

more than one way of escape from fire, so located as to prevent people from being trapped. Such exits should lead either to adequately constructed and properly maintained fire escapes on the outside of the building or to inside stairways, provided with proper hand rails and satisfactory for emergency use. Ladders are not acceptable as fire escapes.

Every exit door should swing in the direction of the exit and should be plainly designated or marked by conspicuous signs or lights to identify the means of escape. Directional signs should be provided where needed.

Fire equipment should be on hand, in an effective operating condition. This equipment may include built-in equipment, such as automatic sprinklers, CO_2, and steam lines, and hand-operated equipment, such as hose and portable fire extinguishers, sand pails, water barrels, and pails. Provisions should be made for the systematic inspection of such equipment.

Flammable Materials. Materials such as paints, lacquers, thinners, gasoline, and naphtha should be stored and handled with provisions for safety suited to the material and the conditions for its use. These materials should be covered or stored in an approved type of suitable safety container.

Atmospheric Contaminants. Workers are not to be exposed to concentrations of atmospheric contaminants hazardous to health. One important control is local exhaust ventilation. Hoods, booths, or other openings must be able to produce a movement of air toward the opening sufficient to prevent escape of contaminants to the workroom.

In judging control, reference should be made to the table of values on maximum allowable concentrations for gases and vapors, appearing in *Safety and Health Standards*. Maximum concentrations, however, should not be the only criterion. The evaluation of a health hazard should also be subject to such factors as the nature of the contaminant and the frequency and duration of the exposure, or clinical evidence of harmful effects.

Personal protective equipment and protective barriers are to be provided whenever substances, radiations, or mechanical irritants are encountered in a manner capable of causing bodily injury or impairment through skin or mucous membrane absorption. If the wearing of such equipment is necessary, it must be fitted to each exposed worker and is to be kept in an efficient and sanitary condition.

Eye protection should be provided if workers are exposed to any hazard which may reasonably be expected to cause eye injuries.

First Aid. The employer must see to it that some person is available, during all periods of plant operation, who has been trained

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to administer first aid and to handle emergencies which may arise out of accidents and injuries to workers.

First-aid facilities and services should be used only for first aid, and should not in any way take the place of necessary care and treatment by a physician. In the absence of a physician, emergency first aid should be given by the nurse, or in her absence by a trained first-aid worker, under the recommended procedures of the American Red Cross, as authorized and posted by the plant physician.

Housekeeping and Special Services. Are there fall hazards, faulty wiring, unguarded machinery? Then in all probability there will be dirty lunchrooms, unsanitary washrooms, sloppiness in general. But where tidiness prevails, care has usually been given to eliminating the more dangerous safety faults.

Clean and sanitary conditions must be maintained throughout the place of employment. Equipment as well as work places must be kept clean.

Separate rooms for eating lunch must be provided in plants where workers are exposed to harmful materials in the workrooms. Such lunchrooms not only must be kept in a sanitary condition at all times, but must be adequately ventilated, lighted, and heated.

The common drinking cup is prohibited. In all places of employment, there must be clean, cool, and safe drinking water in adequate supply and readily accessible to all employees.

Adequate washing and toilet facilities must be maintained in every place of employment. Hot and cold running water, soap, and individual towels are musts!

Injury Frequency Rates. The person or firm to whom the Act applies is required to keep injury frequency rates, calculated quarterly on a calendar basis beginning with the first of January of each year.

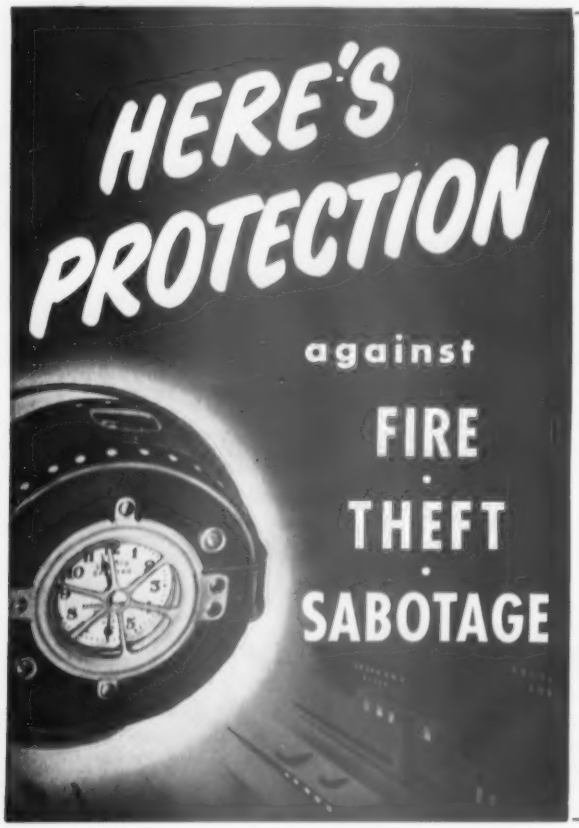
An injury frequency rate is the number of disabling work injuries per million employee-hours worked.

A "disabling work injury" is an injury incurred in the course of and arising out of employment which results in death, permanent total disability, permanent partial disability, or temporary total disability.

The injury frequency rate is based on the total number of deaths, permanent total, permanent partial, and temporary total disabilities which occur during the period covered by the rate. The rate relates these injuries to the hours worked during the period and expresses them in terms of a million-hour unit by use of the following formula:

$$\frac{\text{No. disabling injuries} \times 1{,}000{,}000}{\text{Employee-hours exposure}}$$

Coal Mines. The Divisions' safety and health program covers coal mines through a cooperative safety and health inspection plan with the Federal Bureau of Mines. This plan enables the Divisions, by virtue of the Public Contracts Act, to effect correction of substandard safety and health condi-



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tions in those mines where the Federal Bureau of Mines does not have enforcement power.

In determining compliance by coal mines subject to the Act, the Divisions utilize the safety codes adopted by the Federal Bureau of Mines or the state mine safety code in the state where the mine is located, whichever standard is higher.

The Department is tackling the number one killer in coal mines—roof-fall accidents. "Support that roof" are words that should be engraved in the mind of every coal-mine operator and miner. Last year, 48 per cent of the roof-fall accidents occurred in mines which did not have adequate systematic timbering plans.

In carrying out the coal-mine safety program, the Divisions have also helped protect miners and saved property by stimulating the correction of conditions involving the improper use of explosives in coal blasting, inadequate fire protection, inadequate first-aid facilities.

The use of personal protective equipment and improvement in the general condition of surface structures have been recommended.

Hazardous Occupations Orders. When checking his safety compliance, every employer should remember that the Fair Labor Standards Act prohibits the employment of minors under 18 years of age in occupations which have been found hazardous by the Secretary of Labor. Most employees covered by the Public Contracts Act are also covered by the Fair Labor Standards Act, which applies to employees engaged in interstate commerce or in the production of goods for interstate commerce.

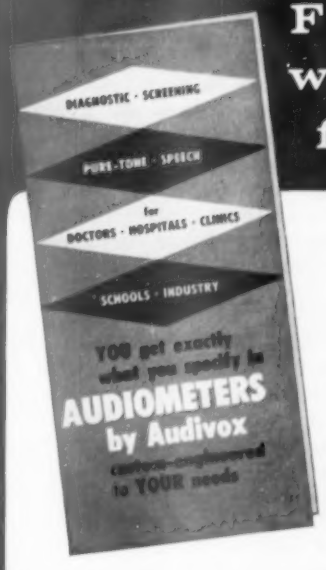
Therefore, although the child-labor provisions of the Public Contracts Act are confined to prohibiting the employment of boys under 16 and girls under 18 on work subject to that Act, the usual employer will have to observe the Fair Labor Standards Act's restrictions on hazardous employment, since the higher standards prevail when employees are covered by both laws.

Some of these orders cut across industry lines, such as that applying to the jobs of motor vehicle driver or driver's helper, and the one covering the operation of elevators and other hoisting apparatus, or riding on a freight elevator unless it is operated by an assigned operator. The texts of the 13 orders issued to date are contained in *Child-Labor Bulletin No. 101*, which may be obtained free from the Divisions.

Most firms found in violation of the safety and health requirements willingly accept governmental assistance in eliminating hazards. Unexpected tangible benefits may be the immediate result, as was the case when a manufacturer obtained a substantial reduction in the cost of his compensation insurance after having increased the emphasis on safety factors following an investigation.

But in the isolated cases where firms have been adamant, the Department has invoked legal sanctions. Through administrative

FREE FOLDER tells the best way to protect your company from costly deafness claims



YOU MAY SAVE your company thousands of dollars from deafness claims and needless accidents with an Audivox Audiometer. This sensitive instrument to measure the hearing power of your employees is low in initial cost and low in maintenance cost, it's compact and light, it's simple to operate, and will give years of trouble-free, accurate service. Write for free folder, *today*.

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Name.....

Firm.....

Street.....

City..... *Zone*... *State*.....

hearing procedures, firms or persons that violate the Act's safety and health provisions can be listed as ineligible to contract with any Federal agency for three years, unless the Secretary of Labor rules otherwise.

More Information Available. Businessmen, safety engineers or private citizens can obtain more details about the statutory requirements by contacting the nearest regional office of the U. S. Labor Department's Wage and Hour and Public Contracts Divisions. Offices are located in the following cities: Boston, New York, Philadelphia, Birmingham, Cleveland, Chicago, Kansas City, Dallas, San Francisco, and Nashville.

Harvard Opens New Aviation Safety Center

ESTABLISHMENT of the Harvard-Guggenheim Center for Aviation Health and Safety at Harvard University's School of Public Health in Boston has been announced jointly by President Nathan M. Pusey of Harvard University and Harry F. Guggenheim, president of The Daniel and Florence Guggenheim Foundation.

The new Center will study responses of the human body to extreme speeds, altitudes, temperatures and toxic agents in flight and on the ground, and carry on basic research in the prevention and control of the increasing dangers of the air age.

The Center, made possible by a grant of $250,000 from The Daniel and Florence Guggenheim Foundation over a five-year period, will begin operation with the start of the 1957-58 academic year under Dr. Ross A. McFarland. Two Daniel and Florence Guggenheim Fellowships of $5,000 each will be awarded annually for graduate study at the new Center. Applications for these fellowships are currently being received and considered.

The Harvard-Guggenheim Center will serve three basic purposes: To unify basic research into the sharply increasing human problems of the jet era; to give advanced training to physicians, biological scientists, and aeronautical engineers, and to serve as a clearing house for technical information on aviation health and safety. It will apply the "inter-disciplinary" or team approach, coordinating the work of such diverse specialists as engineers, physicians, psychologists, physiologists, and anthropologists in solving problems of health and safety in flight.

Dr. McFarland will be the technical director of the Center. He holds the position of associate professor in the Department of Industrial Hygiene which is headed by Professor Philip Drinker. Dr. McFarland, winner of the 1956 John Jeffries Award for "outstanding contributions to the advancement of aeronautics through medical research," is the author of widely used textbooks on human factors in aviation.

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You'll never offend a person by returning a smile.

What They Wear

—*From page 28*

to reduce the family clothing budget. If each move along these lines were not studied carefully, we could drift speedily into competition with the local men's clothiers and, of course, we're trying to maintain good relations with them and want only the clothing business we cannot avoid. Administration of our program for providing special equipment, such as acid suits, is handled centrally—in our toolroom, so the equipment can be obtained round-the-clock in an emergency.

We can't cover this subject without at least a brief mention of gloves. We issue everyone in the refinery leather-palm, canvas-backed work gloves for regular work. We also use a variety of neoprene gloves for wet jobs and jobs involving irritating materials.

Recently we began washing gloves to reduce the cost of our regular work-glove program, because a study of our use of gloves showed that they rarely wore out. Instead, most of the time they were thrown in an ash can because they were wet or saturated with hydrocarbons.

The number of pairs an employee could obtain was left up to the foreman, who was supposed to consider each request individually. Later, as you might expect, foremen handed out gloves on request, and any foreman who didn't wasn't a good sport.

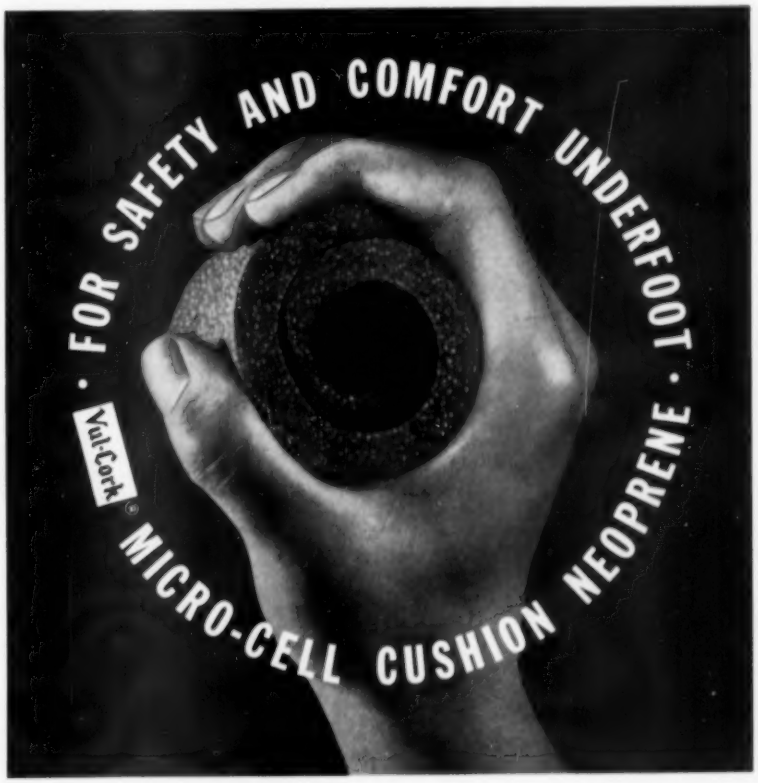
It would be untrue if I claimed we had launched the glove-washing program with little effort. Immediately, we had squawks about dermatitis. We questioned this as we knew the type cleaning process used on gloves was the same as that used on a suit sent to the cleaners. At first, complaints were verbal, then two men showed up with red hands. They blamed the newly washed gloves.

We were concerned, naturally. But fortunately we decided to have complete checks made by a dermatologist who made patch tests on the first two men and on one or two subsequent alleged cases. He found one man allergic to both new and washed gloves and to adhesive tape and other items. The others were not affected.

The dermatitis, which we suspect was just chapped hands, has subsided. It has been a lot of work for our foremen, but they now are obtaining results. As the program calls for turning in old gloves, we have licked their ash-can consumption.

We have a safety-shoe program, though in our Perth Amboy plant there is only moderate exposure to toe injuries as our products are handled largely through a pipe, by truck, or in a barge. Toe injuries have all but vanished and each year we get further away from use of oil drums—good news to any safety engineer.

In our system, shoes are ordered from samples because we don't try to stock them. Shoes are furnished at cost (less $2 a pair) which makes the program



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Comfortable . . . because Vul-Cork's Micro-Cell Cushion Neoprene is actually 40% lighter on the average than other conventional neoprene composition soling materials.

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Vul-Cork Micro-Cell Cushion Neoprene soles are used on the best work shoes made.

Write for free booklet describing all Vul-Cork soles . . . one of which is sure to answer your safety problems.

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VUL-CORK & VUL-CORK NEOPRENE

so light, so flexible, so resilient you can roll them up . . . right in the palm of your hand.

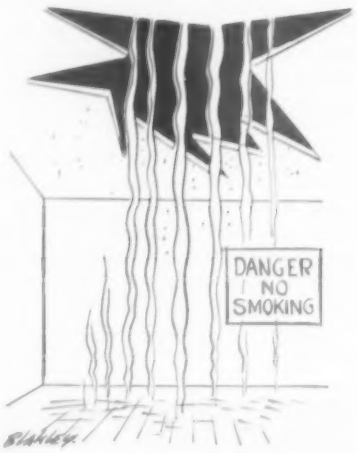
attractive enough to get participation of about 85 per cent of employees and supervisors.

I recall a few experiences in selling the use of body protection devices that have been mentioned. As any safety engineer knows, it isn't sufficient merely to obtain equipment and give it to foremen with the suggestion, "When the men go in there they wear this."

Foremen should want their men to use certain equipment because injuries may result if they don't. This may sound elementary, but I sometimes feel lack of this attitude is a big stumbling block.

Perhaps foremen themselves have gotten away without using such equipment. Perhaps they are old-timers who remember that when they broke in on the job, "We were all hairy-chested men who didn't need to cover ourselves up in sissy stuff."

Your foreman may not tell you he thinks your protective equipment is ridiculous. He may want to avoid an argument, or even to spare the safety engineer's feelings. So I'd like to suggest how you can find out about how well your protection program is sold.



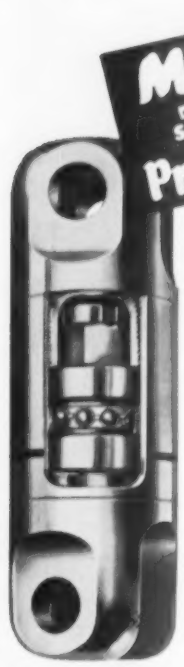
Stick around when the foreman is instructing workers on use of personal protective equipment. If he says, "Now, boys, we're to use this because Mr. Pratt here wants us to," your program is not sold.

If he says, "The company has a rule about this, and we have to wear the stuff," your program is not sold.

If he says, "I want you to wear this equipment because on this job we are exposed to injury if we don't," *then* your program is sold.

For my money, personal protection must be sold right down the line. Most of it isn't nice to wear, and some may be downright uncomfortable. Most of us aren't in the military service and can't have the bugler sound attention while we pass the word, "Now hear this: Uniform of the day will be—." No, it must be sold.

There are as many ways to sell the importance of this equipment as there are foremen who must be sold, or men under foremen. One way that works is getting everyone into the act when a decision is made as to type of equipment to be bought. Of course, we don't consider equipment that doesn't meet company or legal requirements. However, when there is more than one suitable make we



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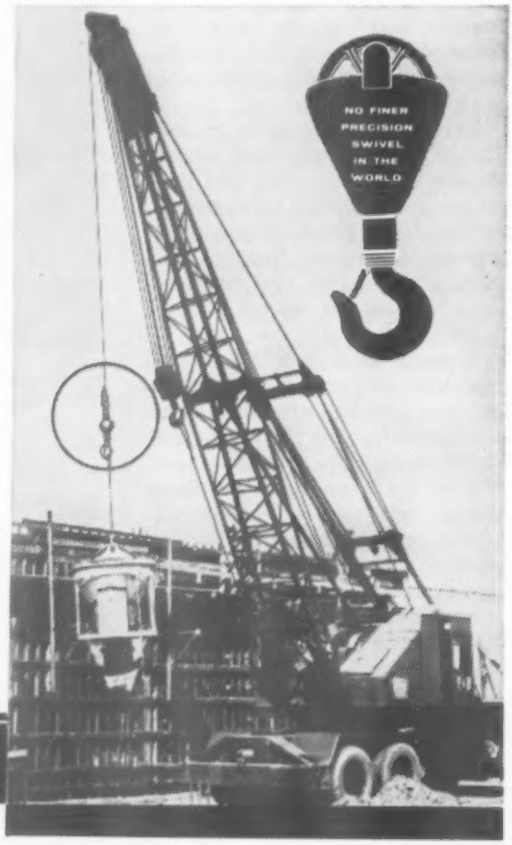

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always buy several of each kind and test them. We solicit views of the men who will have most to do with using the equipment.

Now what I'm proposing is not easy for safety engineers. They'll be running around trying to get agreement. They'll find that the chosen equipment may be supplied by some outfit that makes delivery promptly — every seven and a half months. But I wouldn't propose this extra effort if I didn't feel it helps to sell the program. The men who have picked their own equipment are convinced that they have the most comfortable available. If they can show you, instead of you showing them, you're making progress.

One last thought on selling protective equipment to those who have to wear it: Be sure it's necessary to use the equipment before trying to enforce its use. I have seen that nothing is received quite so coldly as an unnecessary program.

Those of us who have to make rules, but who don't suffer the consequences, are inclined to make lots of rules in an attempt to get all bases covered. Maybe our subconscious thought is that because we've made a rule we've discharged our responsibility. One unnecessary rule, however, will weaken five vital rules. If you want to succeed at selling such a program, make sure what you advocate is necessary.

A typical girl nowadays is old-fashioned enough to be afraid of a mouse, but modern enough to handle a wolf.

The President's Medal

Awards made by the National Safety Council for successful application of artificial respiration

DELBERT H. LANTZ, construction crew supervisor, Northern Indiana Public Service Co., Elkhart, Ind.—suspended respiration due to strangulation.

J. F. HUTCHENS, lineman, Kansas City Power & Light Co., Kansas City, Mo.—electric shock.

HENRY S. KNOWLES, foreman of substation maintenance crew, Chicago, Milwaukee, St. Paul and Pacific Railroad Co., Three Forks, Mont.—electric shock.

ARTHUR MORELAND, heavy equipment operator, Kirchoff Brothers Construction Co., Freelandville, Ind.—lightning.

WILLARD BLOOM, line foreman, Cooperative Light & Power Ass'n. of Lake County, Two Harbors, Minn.—electric shock.

DONALD K. HEWLETT, carpenter, General Telephone Co. of California, San Bernardino, Calif.—electric shock.

HENRY W. ALBRIGHT, lineman, Public Service Co. of Indiana, Inc., Brazil, Ind.—electric shock.

ELMER J. BUGOS, fire marshall, Republic Steel Corp., Parma, Ohio—gas fumes. Certificates of Assistance to STEVE H. PAJKA and E. J. WILSON.

JACK W. EVANS, line foreman, Michigan Bell Telephone Co., Ecorse Twp., Mich.—drowning.

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SAVE EYES!

Leading industrial doctors advise immediate washing with plenty of running water as the best first aid treatment for any chemical in the eyes. Records prove that washing with water for ten minutes or more, close to the accident, is necessary to reduce or eliminate eye damage.

Forehead operation leaves hands free to open eyelids so water can be directed wherever chemicals might be lodged. Sanitary white baked enamel bowl is resistant to most fumes.

Over 500 industrial plant installations have been made to date.

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NEW EMERGENCY SHOWER

The B & A Shower is the quickest and most satisfactory way to saturate a worker with gallons of water the instant an accident occurs, to prevent a disfiguring burn—even a fatality.

Special shower head, no holes to clog—can be used where unfiltered water prevails.

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GLASS SLIVERS AND CHEMICAL IN EYES!
DISFIGURING FACIAL CUTS AND BURNS!
CUTS AND CHEMICAL BURNS ON ARMS AND BODY!
THIS HAPPENS WHEN UNPROTECTED GLASS BOTTLES ARE BUMPED

NEW LOW COST B & A SAF-T-BAGS

5 PINT
1 GALLON
5 GALLON

are widely used for the safe handling of glass bottles containing harmful chemicals; also the storage and recovery of expensive serums, biologicals, and other costly products.

Painful cuts, disfiguring burns, loss of eyesight, or even a fatality, do result from corrosive liquid splash and flying glass when unprotected bottles shatter.

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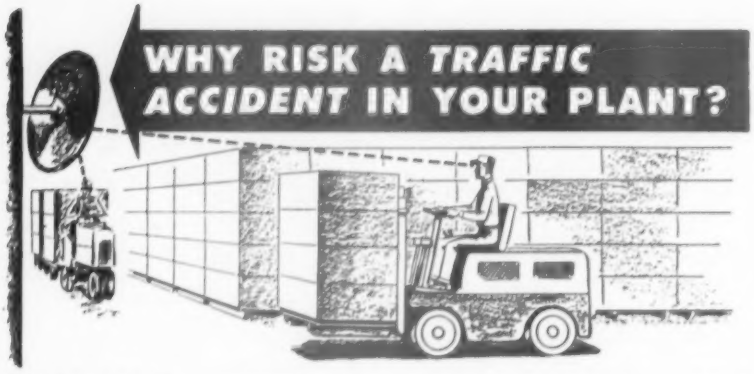

WHY RISK A *TRAFFIC ACCIDENT* IN YOUR PLANT?

KLEAR-VU SAFETY MIRRORS are the answer to the dangerous blind corner problem in your plant or warehouse. They are also adaptable for outdoor use in your parking lot, loading dock area or other points where traffic converges.

Mounted at cross aisle intersections, entrances and exits at a height of 8 to 10 feet, Klear-Vu Safety Mirrors clearly reflect oncoming intersection traffic to both power truck operators and pedestrians.

Style	No.	Dimensions
Circular Convex Glass	120	12" dia.
Circular Convex Glass	180	18" dia.
Circular Convex Glass	240	24" dia.
Circular Convex Glass	300M.R.	30" dia.
Circular Convex Glass	360M.R.	36" dia.
Flat Glass Rectangular	918	9"x18"
Flat Glass Rectangular	1640	16"x24"

M.R. indicates metal rim.

Available in either convex or flat glass styles, the mirrors are easily installed and quickly adjustable to any desired angle.

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All purpose clear plastic goggles, contour shaped for snug, comfortable fit. Large size frame fits easily over the newest and largest prescription glasses. Hundreds of air passages for ventilation are so designed that they prevent flying particles, eliminate fogging. Lens is made of optically correct, shatterproof, impact resisting plastic . . . no metal rivets or fasteners. Clear, wide-angle vision.

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EYEGARD Lenses and Welders' Plates are made with the same painstaking care and accuracy as the finest optical lenses for prescription use. They are ground and polished by experts with years of experience, to eliminate distortion and assure perfect vision, yet they are low in cost. Standard Size and Large Vision (4½" x 5¼") plates and all types of lenses available. Immediate delivery.

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Division of The Burdett Oxygen Co., Cleveland, Ohio

Revise Booklet on Hearing Conservation

The *Guide for Conservation of Hearing in Industry* has been completely revised by the Subcommittee on Noise in Industry of the American Academy of Ophthalmology and Otolaryngology.

The *Guide* contains the latest information on the indications for a hearing conservation program, and the routine procedures which are necessary to conduct the program. A suggested hearing conservation limit has been included which indicates in terms of noise level in specific octave bands when a hearing conservation program is necessary.

It is printed in a 6 x 9 in. booklet of 24 pages; single copies are 25 cents. For further information write the Research Center, Subcommittee on Noise in Industry, 111 N. Bonnie Brae St., Los Angeles 26.

Calendar Contest Winners For March

To the boys in the shop, Jack's a pro.
Shows beginners what they ought to know.
But at home, as a father,
He's too busy to bother.

How would you have completed that limerick? Miss Kathryn A. Krider, drawing release clerk for the Garrett Corp., Los Angeles, won the first prize of $100 in the National Safety Council's "Save-a-Life Line" Contest with this line:

When kids "operate," Dads better "co--"!

The "Save-a-Life Line" Contest appears monthly on the back pages of the Council's Calendar. The theme for the March contest was "Help the Beginner." Second prize of $50 went to Charles Griffin, Duquesne Slag Products, Pittsburgh, Pa., for this line:

With his boy, who's the first he should show!

Third prize went to Mrs. Irene

Goodnight, wife of Roy E. Goodnight, chief clerk, supply dept., Phelps Dodge Corp., Morenci, Ariz. Her winning line was:

A REAL "Pro" never "lets down" his SHOW!

The 30 winners of $5 prizes were:

R. Cheyne-Stout (individual member), Orlando, Fla.

Donald D. Downing, Standard Oil Co. (Ind.), Whiting, Ind.

Ivan L. Herring, Dow Chemical Co., Midland, Mich.

Lois R. Kodalen (individual member) Dodson, Mont.

Mary Mahoney, Goodyear Tire & Rubber Co., Akron, Ohio.

Edward Lau, Pearl Harbor Naval Shipyard, Pearl Harbor, T.H.

Jack L. Walker, Jr., Gifford-Hill & Co. Inc., Dallas, Tex.

Joan B. Willoughby, Travelers Insurance Co., Hartford, Conn.

Jim Opperman, Crucible Steel Co., Pittsburgh, Pa.

Mrs. W. N. Sanders, Tennessee Coal & Iron Div., U.S. Steel Corp., Fairfield, Ala.

Tod H. Keast, Youngstown Sheet & Tube Co., Youngstown, Ohio.

Mrs. Wm. W. Chambers (individual member), Ardmore, Pa.

Mrs. Bobbye Persing, Oklahoma Natural Gas Co., Oklahoma City, Okla.

F. M. Kratschmer, Union Wire Rope Corp., Kansas City, Mo.

Natalie Garvin (individual member), Wallingford, Conn.

Rev. Aloysius Paul Dehnert, Quigley Preparatory Seminary, Chicago, Ill.

Sam Posey, Gulf Refining Co., Houston, Tex.

Mrs. E. A. Wright (individual member), Seattle, Wash.

George Gambler, Bethlehem Steel Co., Bethlehem, Pa.

Mrs. Ray Mellies, Shell Oil Co., Woodriver, Ill.

Fred Diebold, Esso Standard Oil Co., Linden, N.J.

A. L. Jordan, U.S. Post Office, Tulsa, Okla.

Emil Karchnak, Bethlehem Steel Co., Johnstown, Pa.

Mrs. Joe Hemsky, DeKalb Agricultural Ass'n., DeKalb, Ill.

Mrs. George Gannon, Rock Island-Frisco Terminal Ry., St. Louis, Mo.

Woodson B. Gillock, E. I. du Pont de Nemours & Co., Waynesboro, Va.

Mrs. James R. Thompson, Employers Reinsurance Corp., Kansas City, Mo.

S. J. Di Domenico, U. S. Post Office, Pittsburgh, Pa.

K. M. Witt, Alpha Portland Cement Co., Manheim, W. Va.

Dorothy J. Freeman, Sealright Co., Inc., Kansas City, Kan.

NOW! A new anti-skid coating

Goes on...Stays on... Stands up better!

Here is an easy-to-apply Anti-Skid Coating that provides a final answer to safety under foot. Daubert Anti-Skid creates a non-slip surface on concrete, steel or wood for maximum safety on stairsteps, floors, ramps, decks and catwalks. Applies easily, can be sprayed or troweled on. Comes in four colors—black, green, terra cotta, and gray. Rugged, stands up under shock; less flaking and cracking.

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Daubert Chemical Company

Anti-Skid Engineering Division

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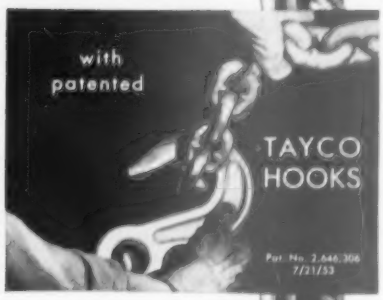

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ASME Meeting to Discuss Jet-Age Problems

JET-AGE AIRCRAFT, atomic power, safer industrial machines, new gas turbine engines, air pollution control and improved mechanization and efficiency in a half-dozen industries will be among the topics covered June 9-14, in San Francisco, at one of the largest meetings of its kind ever held on the West Coast, according to an announcement by The American Society of Mechanical Engineers.

Thousands of engineers, business executives and others are expected to attend the more than 60 technical sessions and panel discussions on the ASME semi-annual meeting program, at the Sheraton Palace Hotel. More than 130 papers by experts in fields ranging from aviation to wood industries will be presented and discussed.

An unusual feature of the meeting will be a four-part symposium on biotechnology, the study of operation of the human body as an engineering problem. Taking part in the sessions will be engineers, medical men and experts on the adaptability of the body to such extreme conditions as "thermal flight." (Thermal flight involves travel at such high speeds that friction between aircraft and atmosphere sharply raises temperatures.)

Other topics include: mechanization of commercial aircraft maintenance; metals engineering; simplification and re-design of aircraft auxiliary equipment such as landing gear and aerial refueling hoses; improved efficiency for the nation's lumber producer; heat transfer in the food processing industry; design of nuclear power plants; air pollution controls; use of computers and other electronic devices in power plants and in machine design; application of solar energy to industrial operations and new approaches to lubrication problems.

Competition: What makes all the good TV shows come on at the same time.

SHOWS CO Hazard INSTANTLY

- Shows CO hazard directly — at a glance
- Requires no color matching or reference to comparator scales
- Test takes only a few seconds
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REPLACEABLE DETECTOR TUBE CONTAINS YELLOW CHEMICAL WHICH TURNS BROWN WHEN AIR "SNIFFED" THROUGH DETECTOR TUBE BY PENCIL-SIZE ASPIRATOR CONTAINS CARBON MONOXIDE

The MONOXOR detects presence of CO, even in concentrations as low as 100 parts CO per million parts of air. Particularly useful for a spot-check of carbon monoxide contamination in garages, vehicular tunnels, mines, industrial plants and wherever gas appliances are operated.

$22.70
Price Complete—includes MONOXOR Instrument, 24 Detector Tubes, 6 Tube Caps, in Pocket Case

For Complete Particulars . . . Clip this ad and mail to us with your name and address, or write for Leaflet 859.

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200 N. BRADDOCK AVE. • PITTSBURGH 8, PA.
Telephone: CHurchill 2-5400
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Here's a unique and effective way to get safety messages read. And you know — and the National Safety Council confirms — that safety messages *which get read* — do help reduce accidents.

Two-way help for your Safety program

AJAX Cups can help . . . because they put their imprinted safety messages right in your worker's hand, several times a day, at just the moment he is relaxed, receptive, most likely to read.

Plus the fact that these crisp, clean AJAX Cups provide the most convenient, comfortable drinking water service, boost employee morale, and reduce the hazard of transmitted infections.

AJAX® CUPS — wedge-shaped, easy to hold, dispense open, ready to drink from; in 4, 6 and 7 oz. sizes, imprinted with assorted stock safety messages at no extra cost—or your own message to order.

AERO® CUPS — for those who prefer a flat-bottom cup; in 3, 4, 5 and 6 oz. sizes. Also with stock safety messages or your own message to order.

Get the full story — ask your paper merchant or write us today for folder giving full details about AJAX and AERO Cups and equipment.

UNITED STATES ENVELOPE COMPANY

General Offices:
Springfield 2, Massachusetts
15 Divisions from Coast to Coast

Roof Falls Campaign

—From page 31

juries from a fall of roof, rib or face by comparison with the average frequency for the previous one, two or three fiscal years, or (2) a perfect record of no chargeable injuries from such falls.

2. Certificate of Commendation. This may be won by a supervisor of production workers if during the campaign year he has had no chargeable injuries from falls of roof, rib or face on his record, and if at least once a month during the campaign he contacts each man under his immediate direction regarding roof fall accidents.

3. Certificate of Meritorious Service. This will be awarded any union local whose members are employed in a mine or mines that meet the campaign goal as specified for the Certificate of Achievement, and whose safety committee carries on the required minimum activities directed at the prevention of roof falls. Such activities include calling attention to safe work practices for preventing roof falls, informing union members of the campaign and its progress, and otherwise cooperating in the campaign.

Particularly, a local union official, such as a member of the safety committee, must contact the mine management, recommend participation in the National Campaign if the mine has not enrolled, and offer cooperation in planning and carrying on a program of activities aimed at preventing roof fall injuries.

A Certificate of Commendation will be given safety committeemen whose union local wins a Meritorious Service Award.

Decorators Upset Color Safety Code

THE INCREASING tendency of industrial designers to harmonize and beautify the interior of new factories may play havoc with safety precautions, says Robert A. Fergusson, president of Rust-

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Oleum Corporation. Strong colors which signify dangerous equipment or moving equipment, are being toned down to fit some artistic decor, he said, with the result that the colors may no longer be recognized as danger signals.

Mr. Fergusson pointed out that his company, before the war, cooperated with the American Standards Association in working out color symbols for factories. Certain basic colors are now generally accepted for factory interiors: Alert orange for portions of machines or equipment that might crush, cut, electrocute or otherwise injure. Vivid yellow to indicate tripping or moving equipment hazards, strike-against objects such as low beams. Pimento red for all fire protection and fire-fighting equipment. Precaution blue, to mark electrical controls, elevators, less hazardous areas, operating levers. Safety green to identify first-aid kits, safety equipment and locations. Purple to warn against radiation hazards. White, gray and black are standard for aisle markers.

Since in an emergency, quick recognition of the contents of a piping system is of paramount importance, colors were also generally designated for pipes. Red for fire protection pipes, yellow or orange for dangerous materials, green for safe materials, and bright blue for protective materials.

"It is true," said Mr. Fergusson, "that a strong blue pipe may not look artistic next to a bright green one, particularly if both cross near a vivid yellow overhead obstruction. But each color means something in factory danger signals. Employees moving from one plant to another understand their surroundings at a glance.

"With some modern factories going in for beautiful coral, lavender, tan, turquoise, and all exotic shades, they have tended to use subdued danger signals. This is an unsound development. We set a high store on the decorative value of paint, but not at the expense of safety. Danger symbols come first, and the rest of the decor ought to be planned around them."

Fafnir Looks Ahead

—*From page 23*

machines could best be obtained by concentrating them in one plant area. Here the know-how of key setup men and machine repairers could be concentrated to keep machines on production a maximum percentage of the time. Here also concentration of large batteries of machines would permit use of the efficient systems for handling steel chips and rings. These systems would pay for themselves only in continuous servicing of large groups of machines.

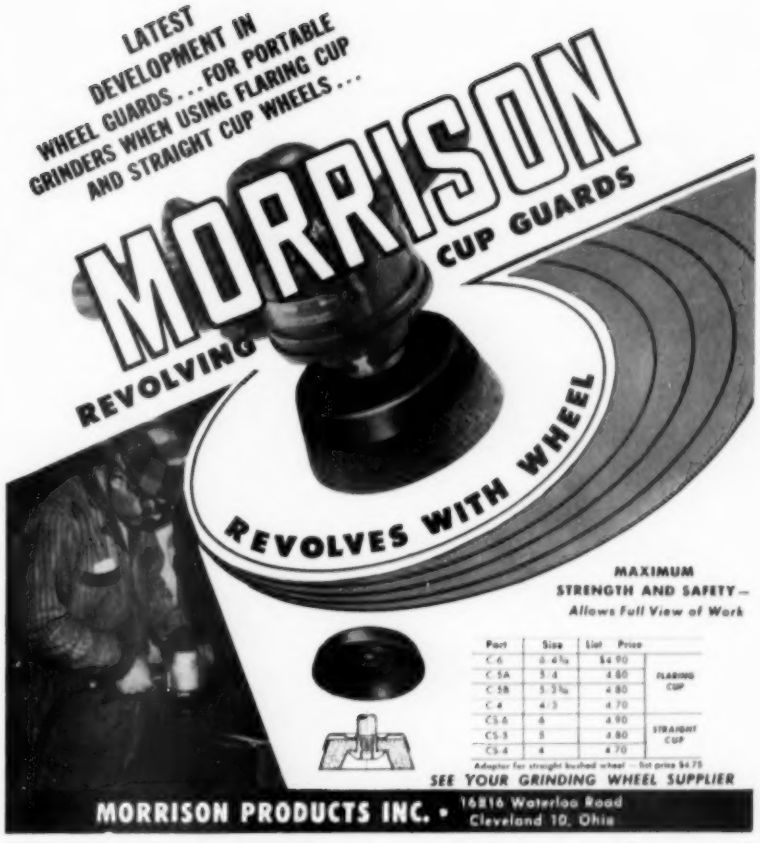
Plant construction. Preparing the site and grading for the 2600-ft. railroad spur line required the moving of 130,000 cu. ft. of earth. The rectangular steel-frame building, in operation since last summer, can be extended in three directions to provide an ultimate 1,100,000 sq. ft. on one floor. Parking space is provided for more than 3000 cars.

The building is of simple, flat-roofed design with insulated aluminum and brick walls on the east and north where a 4-ft. band of fixed sash has been enclosed with blue plate glass to prevent glare. Windowless walls on the south and west are of masonry and corrugated asbestos.

The manufacturing floor is completely open, 320 ft. wide with 18 ft. to the bottom chord of the trusses, permitting facility in handling every phase of production. Forty-by-60 ft. column spacing and "free loading" welded H-section trusses simplified installation of overhead handling facilities throughout the steel storage and manufacturing areas.

Materials handling. Monorail bridge cranes move incoming steel bars and tubes from cars on the enclosed 360-ft. railroad siding to the adjacent storage area. From this point steel is carried as needed to individual screw machines by hoists operating on the interconnecting overhead monorail system.

Belt conveyors parallel to the seven rows of screw machines carry bearing rings from machines to transfer points where au-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tomatic lifts raise boxes full of rings to a single gravity roller conveyor system. All boxes of rings move toward a central washing station en route to second machining, hardening furnaces, and stock shelves or the shipping dock.

Scrap removal. Chips are removed from machines by underfloor conveyors running in 220-ft. trenches beside each bank of automatic screw machines and converging at a central chip processing pit. Coolant removed from chips is re-used after filtering and chips are blown to an outside storage bin for collection by scrap buyers.

Ventilation. Convertible air-handling units installed up in the trusses at strategic points are the principal source of heating. For ventilation in warm weather these have a capacity for circulating 200,000 cfm. of outside air. The equipment can be supplemented by simple installation of cooling coils if required by a change in operations.

Lighting. Continuous fluorescent lighting units equipped with 8-ft. slimline lamps maintain 40 foot-candles of illumination throughout the manufacturing area.

Power distribution. Maximum accessibility of power distribution and air lines and other facilities have been provided by installation of bus duct and piping overhead along the rows of columns which separate the seven batteries of screw machines.

Personal services. Locker rooms, showers and washrooms are located on a central mezzanine 200 ft. by 40 ft. near the center of the plant.

Plant dispensary, boilers and switchgear are also in this location.

Results. The first six months of operation at Newington clearly established the benefits of concentrating like machines in a compact area, Fafnir feels. The combination of mechanical handling and accessibility of specialized setup men and toolroom personnel has reduced indirect labor and waste motion just about as much as would full automation.

The future? The climaxing reward for the thoroughness of the basic planning of the Newington plant is that company development will decide whether the concentration principle will be expanded or the automotion concept introduced at a later date.

The full economic advantages foreseen in concentration will soon be realized. If, in the future, there is evidence that vertical integration of succeeding operations are right for Fafnir's program at that time, the Newington site will accommodate that too. The plant is so designed that little rearrangement of machines would be necessary.

Can You Read This Sign?

UNGRAMMATICAL but effective, this safety signboard at the Phillips Chemical Company's Borger, Tex., plant reads, "Why Is There So Many More Accidents Than There Ought To Be."

The apparent gobbledygook, devised by O. R. Kiphart, safety engineer for the Butadiene Section of the company's Plains Plant, created such interest among employees that some of them called the safety office and tried to discuss accident prevention in the new lingo.

Slogans in this tricky wording are changed periodically to stimulate continuing interest.

Before we talk about what the world owes us, maybe we should collect our thoughts.

For a More Successful Poster Program

POSTER program aids miniatured on this and the following pages are NEW — shown here for the first time. Those illustrated in one color are actually printed in two or more colors.

Also, be sure to refer to the new 1957 Directory of Occupational Posters which contains an excellent selection of 756 posters on a great variety of subjects.

Copies of the new Directory are available at 60 cents each.

JUMBO POSTER for JULY 1957

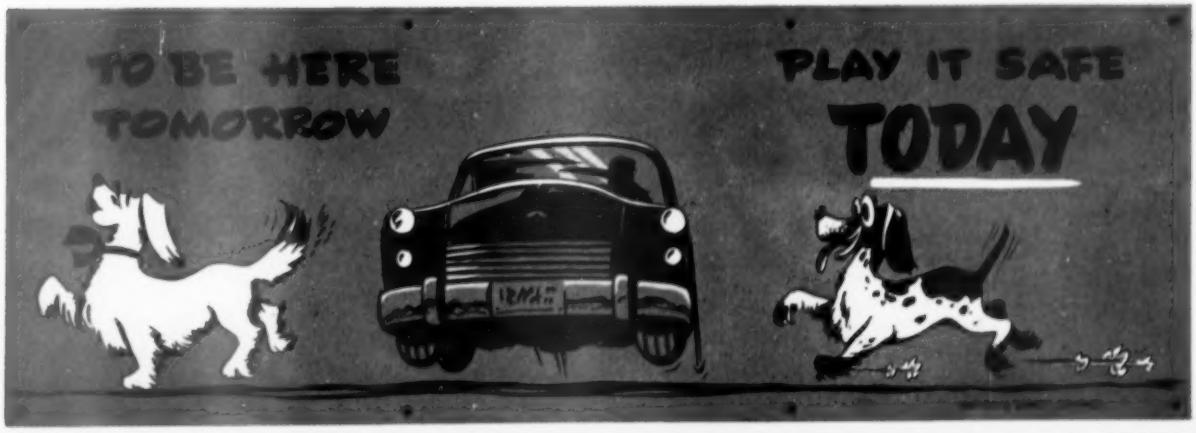
The Jumbo poster, issued monthly, is designed for outdoor use and is available to members on annual subscription but is not stocked. Its actual size is 9' 11" by 11' 8".

SAFETY BANNER FOR JULY, 1957

Here is the attention-getting, monthly cloth banner. Available in two types—indoor and outdoor—both are identical in size (10 feet long by 40 inches high), have the same general message and multi-color design. Indoor type is of sturdy drill with grommets for easy hanging, while the outdoor banner is of extra heavy drill, with wind vents, and has strong stitched-in rope for durability.

1026-A 8½x11½

This new four color poster is illustrative of the 72 four color posters shown in the 1957 Poster Directory.



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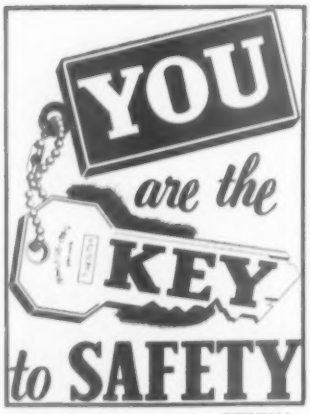

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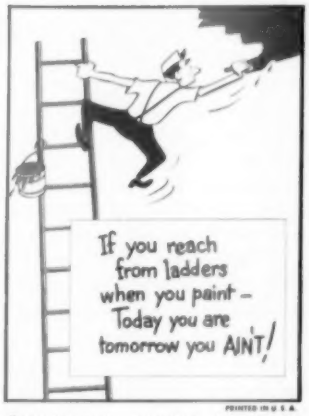

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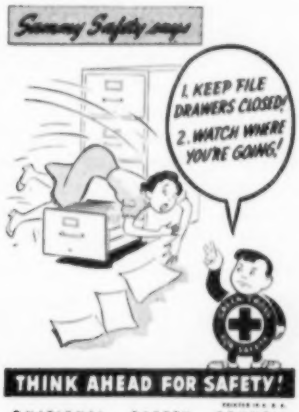

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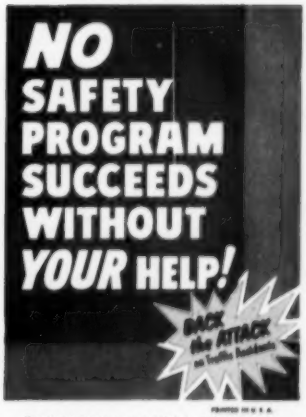

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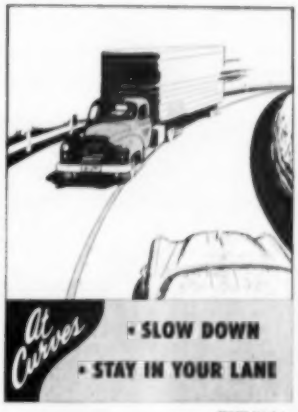

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V-1049-A 8½x11½

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Consultation Corner

—*From page 52*

"A" was able to pull himself out of the tank but by this time his clothing had been completely burned and he had suffered first, second and third degree burns. He died at the hospital.

When the oxygen and acetylene cylinders were shut off, the fire was extinguished in the tank. Inspection revealed that the section of the hoses remaining attached to the torch and to the cylinders were in good condition. There was no explosion.

In our opinion employee "A" had probably knocked away a piece of hot metal, which fell on the hose behind him, burning through the hose and igniting the acetylene released.

What are your recommendations to safeguard against a similar type of accident? Have you a record of any similar accidents from other sources, and what did they do? Do you know of any fire-resistant hoses being used?

Answer. We have consulted the International Acetylene Association for answers to your questions.

From the information you have given, it is extremely difficult to pinpoint exactly what caused the oxygen and acetylene hoses to catch fire. Since there was no explosion or large flames prior to the accident, it is assumed that the tank had been thoroughly cleaned of all flammable residues. Before starting such tank work, it is very important that all flammables such as heavy grease be removed from cracks and crevices around baffles and similar inside parts of a tank.

From your description of the accident and the fact that the fire started in the middle of a good section of hose, we would concur with your expressed opinion that employee "A" probably knocked a piece of hot metal on the hose behind him, burning through the hose and igniting the acetylene released.

Fortunately, this type of accident seldom occurs. About the only way to guard against it is to have employee "B," who is at the manhole, in a position to see where all of the hot metal and sparks are landing. The welder is a "blind" man during torch operations because his dark goggles do not permit him to see dull sparks and hot metal which may ignite his clothing or, in this case, the hose. Thus, he must depend upon his associate to watch the sparks and hot slag.

In answer to your specific questions, we do not know of any fire-resistive hose that may be used on oxy-acetylene torches. Most available hose is made of rubber and must comply with the IAA-RMA specifications.

Neither we nor the Acetylene Association have heard of a similar accident, where a hose has caught fire inside of a tank. There have been several accidents where oxyacetylene hose has been burned in two and the gas ignited from overhead cutting operations. Fortunately, most of these have been in open spaces.

There have also been several

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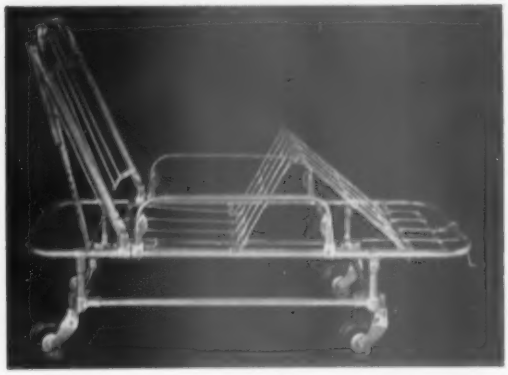

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accidents in tanks where a welder's clothing has caught fire, but these accidents have always involved the release of oxygen or fuel gas in the space. Welders often release oxygen from their torches to "sweeten" the atmosphere and the enriched air makes their clothing burn extremely faster if ignited.

To sum up, the best precautions to prevent a similar accident are:

1. Plan the work so that the hose is out of the way and cannot come in contact with hot metal, slag or the flame from the torch.

2. The "watcher" at the manhole should diligently watch the operation to see that sparks and hot metal are not landing near any combustible material such as clothing or hose.

Cites Economies of Group Relamping

FOUR IMMEDIATE BENEFITS from replacing lamps in large groups rather than one lamp at a time are listed by engineers of General Electric's Large Lamp Department at Nela Park, Cleveland, Ohio.

1. Lower labor cost. By doing the job all at once, it is finished in a fraction of the time it takes to replace lamps one at a time.

2. More light delivered. New, more efficient lamps give more illumination for lighting cost.

3. Fewer work interruptions. Between group relampings, up to 100 per cent of the lamp replacement trouble calls are eliminated.

4. Longer life for auxiliary equipment. Older lamps sometimes flash and blink, damaging fluorescent starters and ballasts. By group relamping, this auxiliary equipment lasts longer.

In an installation of 100 40-watt fluorescent lamps, rated at 7,500 hours or about 1,000 days in a single shift plant, there should be no burnouts in the first 200 days. During the second 200 days, or 40 per cent of life, about 1 per cent should fail. After 400 days and in less than 600 days about five per cent will fail.

Between 600 and 800 days, or 80 per cent of life, 20 per cent of the lamps will have failed. G-E engineers say it pays to relamp at this point or before. By group relamping at 80 per cent of life, it is estimated that 61 costly individual spot replacements would be eliminated.

In considering group relamping, G-E engineers point out that many industries have found:

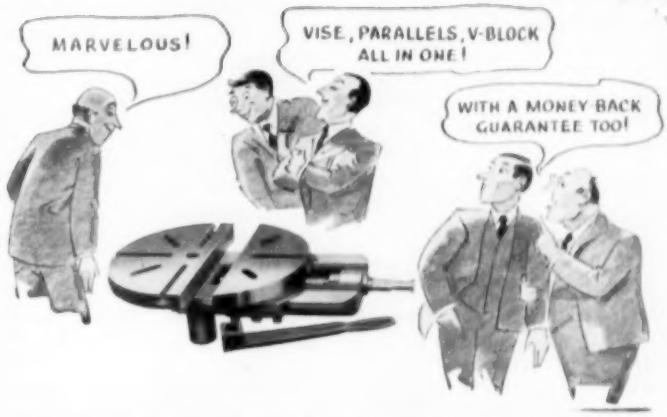
—The cost of spot replacing a burned out lamp is usually more than the price of the lamp itself.

—Actual lamp cost is down because prices have remained relatively constant for the past 10 years while today's lamps give as much as 30 per cent more light than they did in 1950.

—Old lamps give less light because there is a gradual drop off in lighting efficiency as the lamps are used.

"The cost of a lamp is the smallest part of the lighting dollar," G-E engineers state. In a breakdown of the average operating expense for an installation of 40-watt fluorescent lamps, most users find electricity takes 70 per cent of the lighting dollar, labor 20 per cent, and the lamps only 10 per cent.

SAVES TIME! SAVES FINGERS!



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Standards Needed for Air-Crash Rescue

A LACK of standards for aircraft rescue and fire-fighting equipment at many of the world's airports—including several principal ones—is being paid for with human life, George H. Tryon of the National Fire Protection Association revealed at the recent Seventh National Conference on Standards in New York.

Mr. Tryon, assistant technical secretary of the association, said that many efforts have been made to obtain more complete air passenger safety but that the NFPA has not succeeded "in establishing the desired standards of aircraft rescue and fire-fighting equipment at even the principal international airports."

Mr. Tryon cited the crash of a Constellation at Kallang Airport in Singapore two years ago when 31 passengers and two crew members were killed.

"Despite the fact that the aircraft sustained a series of impact shocks after landing 10 ft. short of the runway threshold line, the resulting deaths were fire deaths and not impact deaths," Mr. Tryon reported.

"The inept fire department and would-be rescuers did not have the tools or the knowledge to gain entry into the fuselage. For roughly 13 minutes the fuselage area was free for access by rescue crews, but after this period the wreckage shifted and the fire engulfed the fuselage as cries were heard from the occupants inside."

The mishap occurred seven years after the National Fire Protection Association drafted its first recommendations on aircraft rescue and fire-fighting equipment for airports, according to Mr. Tryon. He called attention to the fact that "aviation is one of the most government-regulated industries of our time."

He said that after the Singapore disaster, the United Kingdom established both domestic and colonial criteria for the provision of aircraft rescue and fire-fighting equipment to forestall another similar debacle. However, British officials "found themselves in some difficult positions at international airports not under British Government jurisdiction.

"Obviously, the life safety requirements did not change enroute. What was required at one airport, to assure the safety of the passengers, should likewise be available at every other airport, regardless of who has administrative control over each of the airports utilized."

He agreed that strict conformance with NFPA standards would work severe hardships in some situations. "The frequency of flight operations is a definite factor in applying a scale of fire protection for an airport," Mr. Tryon said.

He stated that establishment of the desired international recommendations is in a formative stage but cannot be reported on at this time as an accomplished fact.

"It has been our experience," Mr. Tryon said, "that ways and means have been found by airport operators, regardless of their administrative backing, to purchase the tools of the trade. But, when it comes to providing trained personnel to operate the equipment during all periods of flight operations, it has been found that the need for fire department personnel sometimes exceeds the personnel requirements of all other phases of an airport's operations. This has been a major stumbling block."

Mr. Tryon also pointed out that the U.S. courts have ruled that a city performing its fire protection responsibilities is not subject to legal suit for any acts of omission or commission on the part of its fire-fighting force.

However, in the operation of an

"I'd like a job I can put my nose to."

airport, the courts have held that the city is performing a proprietary or corporate function and thus is not immune from suit.

"This fear of legal action has retarded the provision of aircraft rescue and fire-fighting equipment for airports," Mr. Tryon declared. "Many cities have felt that the provision of any equipment would indicate recognition that an obligation existed and if the equipment proved inadequate, the city would be subject to suit."

He contended that airport management groups feel if they should assume legal responsibility they would have everything to lose and very little to gain—that is the equipment and the lives they are seeking to protect will in most cases be the property or responsibility of a third party, the airline.

"Thus, you can see that while it makes sense that airport management have administrative control of aircraft rescue and fire-fighting equipment at airports," he said, "it would hardly be fair to place upon them also the legal responsibility."

Distinguished Service

—*From page 46*

Goodyear Tire & Rubber Co., Nine Awards: Cali, Columbia; Gadsden, Ala.; Goodyear Aircraft Corp.; Akron, Ohio; Goodyear Aircraft Corp., Ariz.; Java, Indonesia; Luxembourg; Mexico; St. Hyacinthe, Que., Canada; Textile, Brazil.

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H. C. Price Co., Spread No. 5, Niles, Mich.

Haynes Stellite Co., Div. of U C C, Main Plant, Kokomo, Ind.

Hawaiian Commercial & Sugar Co., Territory of Hawaii.

Horton Co., Machines Div., Worcester, Mass.

International Harvester Co., Louisville, Ky.

John Wood Co., St. Paul, Minn.

Kennecott Copper Corp., Chino Mines Div., Hurley, N. M.

Lion Oil Co., Div. of Monsanto Chemical Co., El Dorado, Ark.

Management Services Inc., Oak Ridge, Tenn.

Material Service Corp., Chicago.

Minnesota & Ontario Paper Co., Ltd., International Falls, Minn.

Monsanto Chemical Co., Four Awards: Chemical Mfg., St. Louis, Mo.; Lion Oil Co., El Dorado, Chemical Plant; Merrimac Div., Everett, Mass.; Production & Exploration, El Dorado, Ark.

Munising Paper Co., Munising, Mich.

National Starch Products Inc., Plainfield (N. J.) Plant.

New Orleans Public Service Inc., New Orleans, La.

Northrop Aircraft Inc., Anaheim Div., Hawthorne, Calif.

Orenda Engines, Ltd., Terminal A, Toronto, Ont., Canada.

Oscar Mayer & Co., Two Awards: Chicago; Madison, Wis.

Owens Illinois Glass Co., Three Awards: Blair Veneer Co., N. Troy, Vt.; Kimble Glass Div., Vineland, N. J.; Mfg., Glass, 14 Bridgeton, N. J.

Peoples Gas Light & Coke Co., Gas Utility, Chicago.

Philco Corp., Government Ind. Div., Philadelphia.

Pickands Mather & Co., Anvil Palms Mine, Ramsay, Mich.

Pittsburgh & Conneaut Dock Co., Conneaut, Ohio.

Plastics Engineering Co., Sheboygan, Wis.

Remington Arms Co., Inc., Lake City Arsenal, Independence, Mo.

Rohm Haas Co., Philadelphia (Pa.) Bridesburg Plant.

Rohr Aircraft Corp., Chula Vista, Calif.

Royal Typewriter Co., Hartford, Conn.

Ryan Aeronautical Co., Aircraft Parts Mfg., San Diego, Calif.

Saco Lowell Shops, Biddeford, Me.

Schlage Lock Co., San Francisco.

Sealright Co., Inc., Division Oswego Falls Corp., Kansas City, Kan.

Square D. Company, Inc., Controller Div., Milwaukee.

Sylvania Electrical Products Corp., Two Awards: Radio Tube Plant, Altoona, Pa.; Radio Tube Plant, Brookville, Pa.

Tennessee Copper Co., Milling, Copperhill, Tenn.

Tennessee Valley Authority, Over all, Chattanooga, Tenn.

The Vernona Mining Co., Buck Mine, Pickands Mather & Co., Caspian, Mich.

United Concrete Pipe Corp., Baldwin Park, Calif.

United States Gypsum Co., Two Awards: Empire, Nev.; Building Materials, Plaster City, Calif.

U. S. Coast Guard Yard, Shipbuilding & Ship Repairs, Baltimore, Md.

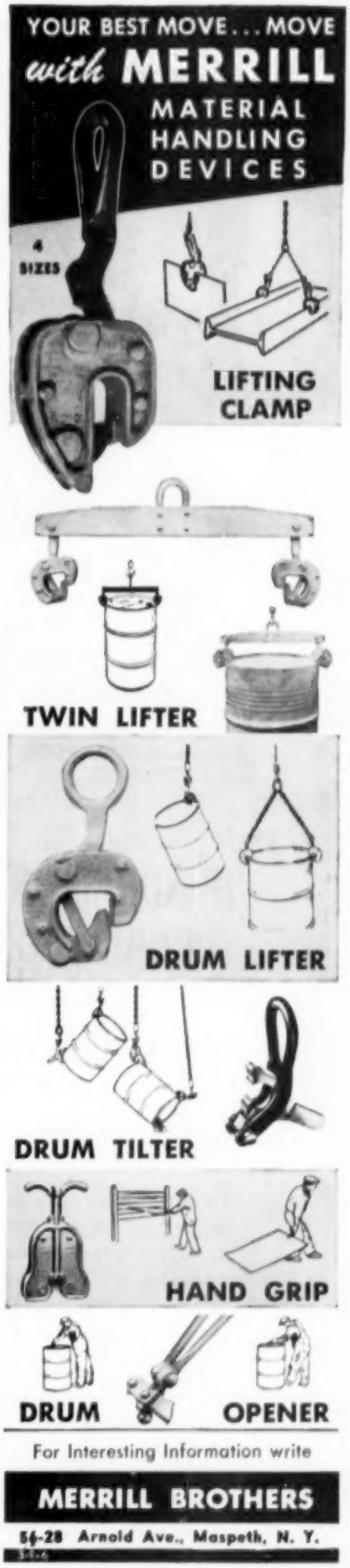
U. S. Industries, Inc., Los Angeles.

U. S. S. Co., Consolidated, Western Steel Corp., Maywood, Calif.

U. S. Steel Products, Div. U. S. Steel Corp., Los Angeles, Calif.

Warner Co., Bellefonte Div., Bell Mine, Bellefonte, Pa.

Western Electric Co., Inc., Four Awards: Distributing House, Chicago; Distrib-



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uting House, Philadelphia; Greensboro (N. C.) Shops; Hawthorne Works, Chicago.

Western Geophysical Co. of America, Los Angeles.

Westinghouse Electric Corp., Kansas City (Mo.) Works.

Weyerhaeuser Timber Co., Three Awards: Logging, Longview, Wash.; Saw Mill, Klamath Falls, Ore.; Saw Mill, Springfield, Ore.

Wood Conversion Co., Cloquet, Minn.

AWARD OF MERIT

ACF Industries, Inc., Security Products, Buffalo, N. Y.

Alco Valve Co., St. Louis, Mo.

Allis Chalmers Mfg. Co., Wis. Works, LaCrosse, Wis.

Aluminum Co. of America, Eight Awards: Nantahla Power & Light Co., Franklin, N. C.; Foundry, Cleveland, Ohio; Fabricating, Edgewater, N. J.; New Kensington Works, Pa.; Sheet Aluminum, Alcoa, Tenn.; Aluminum Ore Co., Mobile, Ala.; Wenatchee Works, Wash.; Smelting Div., Massena, N. Y.

Allied Paper Corp., Two Awards: Paper Book & Cover Manufacture, Kalamazoo, Mich.

American Airlines, Inc., Base Repair, Flushing, N. Y.

American Bridge Co., United States Steel Co., Elmira Plant, N. Y.

American Bridge Div., Erecting Dept., United States Steel Corp.

American Can Co., Illinois Plant 70-A, Chicago.

American Cyanamid Co., Three Awards: Davis & Geck, Danbury, Conn.; New York; Welland Plant, Niagara Falls, Ont.

American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio.

American Sugar Refining Co., Philadelphia.

Anderson Clayton & Co., Mrs. Tuckers Products, Jacksonville, Ill.

Armstrong Cork Co., Building & Ind. Products, Lancaster, Pa.

Aro, Inc., Tullahoma, Tenn.

Arvin Industries, Inc., Radio Div., Columbus, Ind.

Atlas Plywood Corp., Plywood & Flush Door Mfg. Center, Texas.

Atlas Processing Co., Shreveport, La.

Avco Mfg. Corp., Two Awards: Nashville Plant, Tenn.; American Kitchens Div., Connersville, Ind.

Bendix Aviation Corp., York, Pa.

Blaw Knox Co., Wheeling Works, W. Va.

E. W. Bliss Co., Hastings Div., Mich.

Boise Payette Lumber Co., Emmett, Idaho.

C. Brewer & Co., Ltd., Olokele Sugar Co., Ltd.

Bridgeport Brass Co., Two Awards: Brass Mill Products, Indianapolis; Housatonic Plant.

British Columbia Forest Products, Ltd., Victoria Sawmill Div., B. C.

Brown & Bigelow, St. Paul, Minn.

F. N. Burt Co., Inc., Buffalo, N. Y.

Butler Mfg. Co., Kansas City, Mo., and Minneapolis, Minn.

Cabot Carbon Co., Three Awards: Walton Plant, Kermit, Tex.; Schafer A Plant, Pampa, Tex.; Canal Plant, Franklin, La.

California Institute of Technology, Research & Education, Pasadena, Calif.

Callaway Mills Co., Unity Plant, Elmrose Div., LaGrange, Ga.

Canadian Celanese Ltd., Sorel, Quebec.

Canadian Gypsum Co., Ltd., Hagersville, Ont.

Canadian Industries Ltd., Eight Awards: Montreal Bldg. Employees; Edmonton Works; Central Research Lab, Beloit, Can.; New Toronto Fab. Works, Millhaven Works; Nobel Works; Chatham Works, York Works.

Canadian Malartic Gold Mines, Ltd., Quebec.

Canadian Salt Co., Ltd., Windsor, Ont.

Cannon Electric Co., Los Angeles, Entire Company.

Carling Brewing Co., Inc., Frankenmuth, Mich.

Carrier Corp., Syracuse Div., N. Y.

Caterpillar Tractor Co., Trackson Co. Div., Milwaukee.

Celanese Corp. of America, Two Awards: Chemical Lab, Summit, N. J.; Plastics, Belvidere, N. J.

Central Power and Light Co., Corpus Christi, Tex.

Channel Master Corp., Plants 1 and 2, Ellenville, N. Y.

Chase Brass & Copper Co., Inc., Cleveland, Ohio.

Chemstrand Corp., Two Awards: Acrylic Fiber, Decatur, Ala.; Research Labs, Decatur, Ala.

Chicago & Eastern Illinois Railroad, Two Awards: Danville, Ill.

Chicago Dept. of Subways & Super Highways, Cont. & Emp., Chicago.

Chicago Rock Island & Pacific Railroad, Comm. Dept., Chicago.

City of Austin, Austin, Tex.

Clark Equipment Co., Two Awards: Ind. Truck Service Div., Jackson, Mich.; Ind. Truck Div., Battle Creek, Mich.

Clayton & Lambert Mfg. Co., Louisville, Ky.

Colorado Fuel & Iron Corp., Pueblo Plant, Colo.

Consolidated Western Steel Corp., Vernon, Calif.

Corps of Engineers, U. S. Army, Three Awards: Marine Construction Gravelly Point, Va.; Miscellaneous, Gravelly Point, Va.; Dam Construction, Gravelly Point, Va.

G. & H. Corson, Inc., Plymouth Meeting, Pa.

Crossett Lumber Co. & Affiliated Cos., Crossett, Ark.

Dan River Mills, Inc., Danville, Va.

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Deere & Co., Three Awards: Deere Planter Works, Moline, Ill.; Deere Tractor Co., Waterloo, Iowa; Deere Plant Works, Moline, Ill.

Dierks Forests, Inc., Mountain Pine, Ark.

Douglas Aircraft Co., Inc., Long Beach Plant, Calif.

Dow Chemical Co., Three Awards: Madison Div., Ill.; Ludington Div., Mich.; Allyns Point Div., Gales Ferry, Conn.

Dravo Corp. & Subsidiaries, Two Awards: Engineering Works Div., Pittsburgh, Pa.

DuPont Co. of Canada, Ltd., Shawingan Falls, Que.

Echlin Mfg. Co., New Haven, Conn.

Electro Metallurgical Co., Div. of Union Carbide and Carbon Corp., Ashtabula, Ohio.

Esso Standard Co. Brasil, Inc., Bulk Plants, Rio de Janeiro, Brazil.

Exchange Lemon Products Co., Corona, Calif.

Falls Paper & Power Co., Oconto Falls, Wis.

Federal Cartridge Corp., Minneapolis, Minn.

Federal Telecommunication Laboratories, Nutley, N. J.

Firestone Tire & Rubber Co., Seven Awards: Tire Plant, Memphis, Tenn.; Synthetic Rubber Plant, Akron, Ohio; Pottstown, Pa.; Buenos Aires, Argentina; Bennettsville, S. C.; Machine Shop, Akron, Ohio; Sao Paulo, Brazil.

Fischer Lime & Cement Co., Two Awards: Steel Fab., Memphis, Tenn.; Ready Mix Concrete Plant, Memphis, Tenn.

Ford Bacon & Davis Construction Corp., Monroe, La.

Ford Motor Co., Three Awards: Dearborn Iron Foundry; Northville Plant; Motor Plant.

Fraser Companies Ltd., New Castle, B. C., Canada.

Fruit of the Loom, Inc., Pontiac Finishing Plant, Providence, R. I.

Furst McNess Co., Freeport, Ill.

General Electric Co., Four Awards: Hotpoint Co., Plant 8, Cicero, Ill.; Memphis Lamp Works, Tenn.; Youngstown Lamp Works, Ohio; Chemical Products Works, Cleveland, Ohio.

General Foods Corp., Three Awards: Carton & Container Div., Battle Creek, Mich.; Maxwell House Div., Hoboken, N. J.; Gaines Plant, Kankakee, Ill.

General Mills, Inc., Three Awards: Chenwil Plant, Kankakee, Ill.; Mechanical Mfg. Plant, Minneapolis, Minn.; Mfg. and Pkg. Food Products, Lodi, Calif.

B. F. Goodrich Co., Two Awards: Clarksville, Tenn.; Cadillac Plant, Mich.

Goodyear Tire & Rubber Co., Three Awards: Brasil, Ont.; Los Angeles; Clearwater Mills, 3 Cartersville.

Graniteville Co., Maintenance, Graniteville, S. C., and Augusta, Ga.

Great Lakes Pipe Line Co., Kansas City, Mo.

A. P. Green Fire Brick Co., Mexico, Mo.

Gulf States Utilities Co., Beaumont, Tex.

C. Hager & Sons Hinge Mfg. Co., St. Louis, Mo.

Hammel Dahl Co., Warwick, Providence, R. I.

Hanna Engineering Works, Chicago.

H. J. Heinz Co., Two Awards: Muscatine, Iowa; Holland, Mich.

Hotpoint Co., Chicago.

Humko Co., Memphis, Tenn.

Hyster Co., Portland, Ore.

International Business Machine Corp., Two Awards: Plant 2, Poughkeepsie, N. Y.; Plant 3, Washington.

International Milling Co., Salina Mill, Kan.

International Paper Co., Moss Point Mill, Miss.

Jefferson Island Salt Co., Jefferson Island, La.

Kennecott Copper Corp., Two Awards: Nevada Mines Div., McGill, Nev.; Ray Mines Div., Ray, Ariz.

Kimberly Clark Corp., Two Awards: Crepe Wadding, Neenah Mill, Wis.; Staff Eng. Dept., Neenah, Wis.

King Street Station, Seattle, Wash.

LaSalle Steel Co., Hammond, Ind.

Leslie Co., Lyndhurst, N. J.

Los Angeles Union Passenger Terminal, Los Angeles.

Magnavox Co., Two Awards: Fort Wayne, Ind.

Marquette Cement Mfg. Co., Des Moines, Iowa.

Glenn L. Martin Co., Baltimore, Md.

Massey Harris Ferguson, Ltd., Toronto Works Div., Ont.

Material Service Corp., Two Awards: Lockport Machine Shop, Lockport, Ill.; Thornton Quarry, Thornton, Ill.

McCloud River Lumber Co., McCloud, Calif.

McColl Frontenac Oil Co., Ltd., Montreal Works.

McQuay Norris Mfg. Co., St. Louis, Mo.

Mead Corp., Two Awards: Heald Div., Lynchburg, Va.; Wheelwright, Leominster, Mass.

Mengel Co., Five Awards: Nashville Corrugated Box Co., Tenn.; Fulton, N. Y.; Boxes and Containers, Winston Salem, N. C.; Furniture, Winston Salem, N. C.; Louisville, Ky.

Mennonite Publishing House, Scottdale, Pa.

Merck & Co., Inc., Two Awards: Sharp & Dohme Co. Div., Glenolden, Pa.; Sharp & Dohme Co. Div., Philadelphia.

Merck & Co., Ltd., Valleyfield, Quebec.

Mid Valley Pipeline Co., Longview, Tex.

Miller Brewing Co., Milwaukee.

Milprint, Inc., De Pere, Tex.

Milwaukee Electric Tool Corp., Milwaukee.

Missouri Pacific Railroad Co., Two Awards: St. Louis, Mo.; Sedalia Shop, Sedalia, Mo.

Monsanto Chemical Co., Three Awards: Industrial Resins, Seattle, Wash.; Trenton, Mich.; Lion Oil Co.

Morton Salt Co., Bay Chemical Co., Weeks, La.

Mount Vernon Mills, Woodbury Mills, Inc., Tallassee, Ala.

Murray Mfg. Co., Murray, Ky.

Murray Ohio Mfg. Co., Cleveland, Ohio.

C. H. Musselman Co., Two Awards: Food Processing, Biglerville, Pa.; Gardners Plant, Biglerville, Pa.

National Carbon Co., Div. of U. C. C. Corp., Warehouse, Jersey City, N. J.

National Malleable & Steel Castings Co., Sharon, Pa.

Neenah Foundry Co., Neenah, Wis.

Nestles Co., Inc., Fulton, N. Y.

Alfred Nickles Bakery, Inc., Navarre, Ohio.

North American Cement Corp., Security Plant, Hagerstown, Md.

Norton Corp., Behr Manning Corp., Troy, N. Y.

Ohio & Western Pennsylvania Dock Co., Cleveland, Ohio.

Oliver Corp., A. B. Farquhar Co. Div., York, Pa.

Oswego Falls Corp., Fulton Plant, Fulton, N. Y.

Owens Illinois Glass Co., Three Awards: Central Hold Shop, Oakland, Calif.; Kimble Glass Div., Warsaw, Ind., Huntington, W. Va.

Penn Steel Casting Co., Chester, Pa.

Penna. Salt Mfg. Co., Cornwells Heights, Pa.

Philco Corp., Two Awards: Lansdale Tube Co., Lansdale, Pa.; Plant 90, Bedford, Ind.

Pickands Mather & Co., Newport Mine, Ironwood, Mich.

Pittsburgh Des Moines Steel Co., Neville Island Branch, Pa.

Planter Mfg. Co., Inc., Portsmouth, Va.

H. C. Price Co., Two Awards: Spread No. 1, Oak Hill, Ohio; Spread No. 2, Milan, Tenn.

Procter & Gamble Co., Buckeye Cotton Oil Co., Memphis, Tenn.

RCA Victor Co., Ltd., Montreal Plant and Head Office, Montreal, Que.

Ralston Purina Co., Two Awards: Wilmington, Del.; Fort Worth, Tex.

Remington Arms Co., Inc., Ilion, N. Y.

Remington Rand, Div. of Sperry Rand Corp., Research Lab, South Norwalk, Conn.

Reo Motors, Inc., Lansing, Mich.

Revere Copper & Brass, Inc., Two Awards: Tube Div., Baltimore, Md.; Baltimore Carton Div., Baltimore, Md.

Rockwell Spring & Axle Co., Standard Steel Spring Div., Gary, Ind.

St. Lawrence Corp., Ltd., Red Rock Div., Red Rock, Ont.

Sandia Corp., Albuquerque, N. M.

Scaife Co., Oakmont, Pa.

Schenley Industries, Inc., Two Awards: Chess & Wymond, Louisville, Ky.; Geo. T. Stagg Co., Lebanon, Ky.

Schield Bantam Co., Inc., Waverly, Iowa.

C. Schmidt & Sons, Inc., Philadelphia.

Sealright Co., Div. of Oswego Falls Corp., Kansas City, Kan.

Shawinigan Resins Corp., Indian Orchard, Mass.

Smith Douglass Co., Inc., Lakeland, Fla.

Sohio Petroleum Co., Oklahoma City, Okla.

Solar Aircraft Co., Des Moines, Iowa.

Standard Oil Co., Three Awards: Whiting Refinery, Ind.; Wholesale Marketing, Chicago; Mfg. Dept., Chicago.

Standard Railway Equipment Mfg. Co., Hammond, Ind.

Stauffer Chemical Co., Dominque Plant.

Stewart Warner Corp., Heating and Air Conditioning Div., Lebanon, Ind.

Stockham Valves & Fittings, Birmingham, Ala.

Superior Tube Co., Norristown, Pa.

Sylvania Electric Product Corp., Three Awards: General Engineering, Emporium, Pa.; Tube Plant, Mill Hall, Pa.; Development Plant, Emporium, Pa.

Chas. Taylor Sons Co., South Shore, Ky.

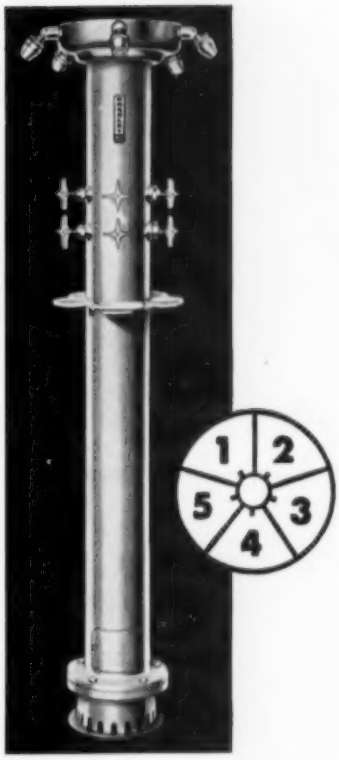
Teletype Corp., Chicago.

Tennessee Valley Authority, Four Awards: Gallatin Steam Plant; John Sevier Steam Plant, Rogersville, Tenn.; Wilson Dam, Ala.; Widows Creek, Ala.

Thilmany Pulp & Paper Co., Bag Mill, Kaukauna, Wis.

Towle Mfg. Co., Newburyport, Mass.

Union Carbide and Carbon Corp., Six Awards: Kemet Co., Cleveland, Ohio; Linde Air Products Co., Purox Factory, Los Angeles; National Carbon Co., Asheboro, N. C.; National Carbon Co., Greenville, N. C.; Haynes Stellite Co., Alexandria Plant, Ind.;



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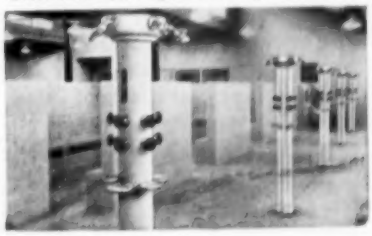

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National Carbon Co., Red Oak, Iowa.

Union Carbide Nuclear Co., Oak Ridge Gaseous Diffusion Plant, Tenn.

Union Oil Co. of Calif., Los Angeles Refinery.

United Can & Glass Co., Hayward, Calif.

United States Gypsum Co., Three Awards: Oakfield Plant, N. Y.; Fort Dodge Plant, Iowa; New Braunfels, Tex.

U. S. Naval Air Turbine Test Station, Trenton, N. J.

Victor Chemical Works, Tarpon Springs, Fla.

Vitreous Steel Products Co., Nappanee, Ind.

Warner Co., Bellefonte Div., Bellefonte, Pa.

Western Electric Co., Inc., Thirteen Awards: Brooklyn, N. Y., Distributing House, Washington, D. C., Distributing House; Syracuse, N. Y., Distributing House, Los Angeles Distributing House; Dallas Area, Tex.; New York Distributing House; Detroit Area, Mich.; Pittsburgh, Pa., Distributing House; Atlanta - West Area of Telephone Sales Div.-Inst.; Detroit, Mich., Distributing House; Boston Distributing House, Watertown, Mass.; St. Louis, Mo.; Distributing House; San Francisco Distributing House.

West Virginia Pulp & Paper Co., Covington Mill, Va.

Westinghouse Electric Corp., Five Awards: Windsor Mfg. & Repair Corp., Brooklyn, N. Y.; Irwin Works, Irwin, Pa.; Atomic Equipment Dept., Cheswick, Pa.; Steam Div., Essington, Pa.; Trafford, Pa.

Weyerhaeuser Timber Co., Seven Awards: Tacoma Office, Wash.; Springfield, Ore.; Enumclaw, Wash.; Longview, Wash.; Everett Lumber Div., Wash.; Springfield Plywood Div., Springfield, Ore.; Newark Retail Yard, Newark, N. J.

Youngstown Sheet & Tube Co., Two Awards: Campbell Plant, Youngstown, Ohio; Briar Hill Works, Youngstown, Ohio.

Wyman Gordon Co., Worcester Plant, Mass.

CERTIFICATE OF COMMENDATION

Abrams Instrument Corp., Lansing, Mich.

American Cyanamid Co., Ten Awards: Charlotte (N. C.) Plant; Fortier Plant, Jefferson Branch, La.; Fort Worth (Tex.) Plant; Gloucester (N. Y.) Plant; Marietta (Ohio) Plant; Mobile (Ala.) Plant; Panama City (Fla.) Plant; Princeton Plant, Penns Neck, N. J.; Savannah (Ga.) Plant; Woodbridge (N. Y.) Plant.

American Excelsior Corp., Marinette, Wis.

American Potash & Chemical Corp., Eston Chemicals Div., Los Angeles.

American Synthetic Rubber Corp., Louisville, Ky.

Aurora Gasoline Co., Trucking Div., Elsie, Mich.

Auto Soler Co., Atlanta, Ga.

Automatic Sprinkler Corp. of America, Youngstown, Ohio.

B. F. Goodrich Co., Four Awards: American Anode Co., Riverside, N. J.; Hydraulic Rubber Hose, Marion, Ohio; Los Angeles, Calif.; Troy (N. Y.) Plant.

Barium Products, Ltd., San Francisco.

Best Foods, Inc., Flour & Cereal Div., Buffalo, N. Y.

British American Oil Co., Ltd., Edmonton Refinery, Alberta, Canada.

Cabot Carbon Co., Five Awards: Estes Plant, Wickett, Tex.; Kermit (Tex.) Plant; Machine Shops, Pampa, Tex.; Schafer B Plant, Pampa, Tex.; Supply & Clerical, Pampa, Tex.

Calumet Steel Castings Corp., Hammond, Ind.

Canadian Gypsum Co., Ltd., Montreal Plant, Montreal, Quebec.

Canadian Industries, Ltd., Two Awards: Copper Cliff Works; Paint & Varnish Development Lab, Canada.

Canadian Industries Ltd., Seven Awards: Canadian Safety Fuse Co., Ltd.; James Island Works; Brainerd Works, Calgary Works, Alta.; Hamilton Fertilizer Works; Beloeil Fertilizer Works, Montreal; Halifax Works, Fertilizer; Montreal Works, Paints Div., Que.

Canadian Resins & Chemical Ltd., Shawinigan Falls, Quebec, Canada.

Canadian Salt Co., Ltd., Windsor Works, Windsor, Ontario, Canada.

Celanese Corp. of America, Chemical Laboratories, Clarkwood, Tex.

Central Kansas Electric Cooperative, Inc., Great Bend, Kan.

Certain-Teed Products Corp., Miller, Tex.

Columbia Southern Chemical Corp., Quebec, Canada.

Consumers Cooperative Association, Three Awards: Printing Dept., Kansas City; Refining, Phillipsburg, Kan.; Warehouse, Phillipsburg, Kan.

Davison Chemical Co., Two Awards: Div. of W. R. Grace & Co., Lansing, Mich.; Wilmington, N. C.

Dean Milk Co., Franklin Park, Ill.

Deere & Co., Mixed Car Warehouse, Moline, Ill.

Dominion Tar & Chemical Co., Ltd., Two Awards: Can Creosoting Co., Delson, Que.; Sifto Salt Ltd., Sarnia, Ontario.

Dravo Corp. & Subsidiaries, Fullerton Portsmouth Bridge Co.; Realty Div.

Electric Regulator Corp., Norwalk, Conn.

Federal Chemical Co., Louisville, Ky.

Ferro Corp., Three Awards: Ferro Frit Div., Los Angeles; Nashville Plant, Fiber Glass Div.; Nashville Plant, Frit Div.

Firestone Tire & Rubber Co., Four Awards: Defense Products, Magnolia, Ark.; Memphis Flotation Gear Div.,

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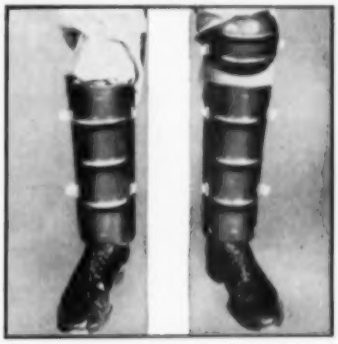

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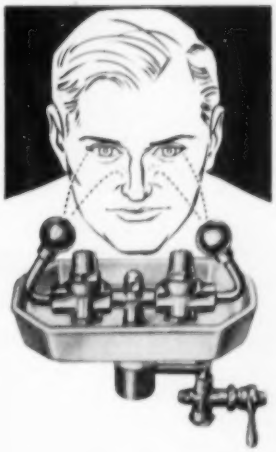

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Reclaim Rubber Plant, Los Angeles; Akron (Ohio) Retread Shop.

Fischer Lime & Cement Co., Two Awards: Bldg. Materials Plant, Memphis, Tenn.; Concrete Production Co., Memphis, Tenn.

Gates Rubber Co. of Canada, Ltd., Rubber Products Mfg., Ont., Canada.

General Electric Co., Five Awards: Bucyrus (Ohio) Lamp Works; Jackson (Miss.) Lamp Works; Los Angeles Apparatus Service Shop; Nela Press, Nela Park, Cleveland, Ohio; Phenolic Products Plant, Pittsfield, Mass.

General Foods Corp., Two Awards: Clarksville (Tenn.) Plant; Minute Tapioca Co., Inc., Orange, Mass.

General Mills Inc., Ten Awards: Bag Factory, Vallejo, Calif; Duluth (Minn.) Grain Storage; Flour & Feed Mill, Chicago; Flour & Feed Grain, Great Falls, Mont.; Flour, Feed & Grain, Los Angeles; Flour & Feed Mill & Grain, Wichita, Kan.; Mfg. Oat Cereal, Keokuk, Iowa; Mfg. & Pkg. Feeds, Rossford, Ohio; Research Farm, Indianola, Iowa; Rosford, Ohio.

Georgia Fertilizer Co., Valdosta, Ga.

Georgia Pacific Corp., Plywood, Toledo, Ore.

Glass Containers, Inc., Central 61, Antioch, Calif.

Goodyear Tire & Rubber Co., Two Awards: Reclaim, Akron, Ohio; Muncie, Ind.

W. R. Grace & Co., Two Awards: Fertilizer & Superphosphate Mfg., Columbus, Ohio; Perry, Iowa.

Graniteville Co., Two Awards: Miscellaneous Div., Graniteville, S. C.; Augusta, Ga.; Warrenville, S. C.

Great Southern Chemical Corp., Corpus Christi, Tex.

H. J. Heinz Co., Salem, N. J.

International Milling Co., Four Awards: Davenport, Iowa; Lockport, N. Y.; Newton, Kan.; Ponca City, Okla.

J. F. Baker Co., Three Awards: Lancaster County, Bainbridge, Pa.; Berkeley County, Inwood, W. Va.; York County, York, Pa.

Jamaica Gypsum Ltd., Jamaica, B W I.

Kaiser Aluminum & Chemical Corp., Two Awards, Permanente, Calif.

Kaiser Gypsum Co., Inc., Seattle, Wash.

Kimberly Clark Corp. of Canada, Kapuskansing, Ontario, Canada.

Kingston Trap Rock Co., Lambertville Quarry Co., Lambertville, N. J.

Kopp Glass Inc., Swissvale, Pittsburgh, Pa.

Koppers Co., Inc., Four Awards: Chemaco Plant, Berkely Heights, N. J.; Oil City (Pa.) Plant; Penacol Plant, Petrolia, Pa.; Williams Plant, Port Arthur, Tex.

Lennox Furnace Co., Marshalltown Foundry Co., Iowa.

Marathon Corp., Two Awards: Ashland, Wis.; Sunnyside, Wash.

Material Service Corp., Cayuga Sand Gravel Plant, Ind.

McColl Frontenanac Oil Co., Ltd., Toronto, Terminal.

Medical Supply Co., Rockford, Ill.

Merck & Co., Inc., Three Awards: East Coast Branch, Rahway, N. J.; Pacific Coast Branch, Los Angeles; St. Louis Branch.

Miller Equipment Co., Inc., Franklin, Pa.

Mississippi Lime Co., Lime Production, Ste. Genevieve, Mo.

Monsanto Chemical Co., Five Awards: Pipeline Dept., El Dorado, Ark., Plant D, Anniston, Ala.; Monsanto Canada Ltd., Ville La Salle Plant, Montreal, Quebec, Canada; Wholesale Marketing, El Dorado, Ark.; Oakville, Ltd., Oakville, Ontario, Canada.

New York Wire Cloth Co., Two Awards: Durall Products Div., York, Pa.; Wire Products, York, Pa.

Nobles Cooperative Electric, Worthington, Minn.

Olin Mathieson Chemical Corp., Alabama Plant, Huntsville, Ala.

Owens Illinois Glass Co., Two Awards: Pacific Grove California Plant 91; Warehouse, Terre Haute, Ind., Plant 25.

Pennsylvania Salt Mfg. Co., Four Awards: Calvert City, Ky.; Natrona, Research Laboratory, Whitemarsh; Tacoma.

Peter Paul Inc., Philadelphia Div.

Pickwick Electric Cooperative, Selmer, Tenn.

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Platte Pipe Line Co., Petroleum Transportation, Kansas City, Mo.

Presque Isle Corp., Alpena, Mich.

Quaker Oats Co., Tecumseh, Mich.

Ralston Purina Co., Ten Awards: Feed Livestock & Poultry, Macon, Ga.; Feed Mfg. Denver, Colo.; Feed Mfg. Omaha, Neb.; Feed Mfg. Pocatello, Idaho; Feed Mfg. Smithville, Ontario, Canada; Oklahoma City, Okla.; Products Mfg. St. Louis, Mo.; Purina Road, Gainesville, Ga.; Feed Mfg. Stockton, Calif.; Feed Mfg. Tampa, Fla.; Ry Krisp Branch, Minneapolis, Minn.

Remington Arms Co., Inc., Findlay, Ohio.

Revere Copper & Brass Inc., Clinton Mfg. Div., Clinton, Ill.

Richmond Municipal Electric Lighting & Power Plant, Richmond, Ind.

Riegel Paper Corp., Hughesville, N. J.

Safety First Supply Co., Pittsburgh, Pa.

Schenley Industries Inc., Three Awards: Jos. S. Finch & Co., Cedarhurst, Md.; Geo. T. Stagg Co., Limestone Springs, Ky.; Pebbleford Distillery Co., Ky.

Signode Steel Strapping Co., Wierton Plant, Wierton, W. Va.

Smith Douglass Co., Inc., Smith Rowland Co., Granite City, Ill.

Spencer Kellogg & Sons, Inc., Two Awards: Bellevue, Ohio; Chicago.

Standard Lime & Cement Co., Kimballton, Va.

Standard Lime and Stone Co., Bakerton, W. Va.

Standard Oil Co., Marine Div., Cleveland, Ohio.

Stauffer Chemical Co., Fifteen Awards: Agricultural Research Lab, Los Altos, Calif.; Bentonville, Va.; Berkeley (Calif.) Plant; Chauncey, New York; Chauncey (N. Y.) Engineering Dept.; Chauncey (N. Y.) Research Center; Chester, Pa.; Houston, Tex.; Louisville, Ky.; Lowland, Tenn.; Montrose Chemical Corp. of California; Roanoke, Va.; St. Louis, Mo.; Tampa, Fla.; Tarrance Research Dept.; California.

Stroehmann Brothers Co., Bakery, Norristown, Pa.

Swift & Co., Plant Food Div., Albany, Ga.

Sylvania Electric Products Corp., Two Awards: Finishing & Shipping, Williamsport, Pa.; Montoursville, Pa.

Talon Inc., Two Awards: Stanley, N. C.; Plant 1, Woodland, N. C.

Toledo Lorain & Fairport, Lorain, Ohio.

Toms River Corp., Two Awards, Cincinnati Chemical Works, Cincinnati; Cincinnati Chemical Works, St. Bernard.

Trumbull Mfg. Co., Warren, Ohio.

U C C Corp., Three Awards: Bakelite Co., Wyandotte, Mich.; National Carbon Co., Fremont, Ohio; Republic Plant, Niagara Falls, N. Y.

U. S. Forest Service, Inyo National Forest, Bishop, Calif.

U S S Co., Consolidated Western Steel Corp., Fresno, Calif.

Union Asbestos & Rubber Co., Marshville (N. C.) Plant 5.

United States Gypsum Co., Three Awards: Boston Plant, Charlestown, Mass.; Heath (Mont.) Plant; Wallboard & Plaster, River Rouge, Mich.

United States Rubber Co., Two Awards: Dominion Rubber Co., Ltd., Can Lastex Co., Dominion Rubber Co., Ltd., Montreal, Canada.

Western Electric Co., Seven Awards: Dallas, Tex., Distributing House; Distributing House, Portland, Ore.; Distributing House, St. Louis, Mo.; Indianapolis Distributing House; Jacksonville (Fla.) Distributing House; New Haven (Conn.) Distributing House; Queensboro Shops, Middle Village, N. Y.

Westinghouse Electric Corp., Two Awards: Commercial Atomic Power, Pittsburgh, Pa.; Industrial Electrical Dept., Baltimore, Md.

Wyandotte Chemicals Co., Alpena Limestone Quarry, Mich.

Wyco Pipe Line Co., Denver, Colo.

Victor Chemical Works, A. R. Mass Chemical Co., South Gate, Calif.

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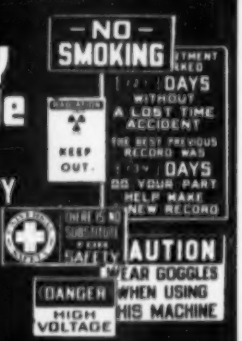

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Safety Leaders

—From page 44

Flour Mill, Chicago, Flour Mill, Wichita, Kans., Flour and Feed Mill, Los Angeles; Ralston Purina Co., (four awards): Iowa Falls, Wilmington, Macon and Delmar Branches; Pillsbury Mills, Inc., Astoria, Ore.; International Milling Co., Salina Mill.

Group C—Ralston Purina Co. (12 awards): Gainesville, Omaha, Denver, Tampa, Los Angeles, Wilson, Decatur, Oklahoma City, Stockton, Lubbock, Miami and Pocatello Branches, and Checkerboard Soybean Co., Decatur, Ill; International Milling Co. (four awards): Davenport, New Ulm, Blackwell and Capital "B" Mills; Spencer Kellogg and Sons, Inc. (two awards): Bellevue, Ohio, and Chicago; Igleheart Bros., Jell-O Div. General Foods Corp., Clarksville, Tenn.; Carnation Co., Albers Milling Div. (two awards): Kansas City and Los Angeles; General Mills, Inc., Flour Mills (two awards): Great Falls, Mont., and Amarillo, Tex.; Pillsbury Mills, Inc. (two awards): Nashville, Tenn., and Clinton, Ia., Soy.

Government—U. S. Dept. of Agriculture, Agricultural Stabilization and Conservation, State and County Offices, Indiana.

DIVISION II

Group A—Nestle Co.

Group B—General Mills, Inc. (two awards): Flour Mill, Lodi, Calif., and Purity Oats Plant, Minneapolis; The Best Foods, Inc., Cereal Div.; Minute Tapioca, Jell-O-Div., General Foods Corp., Orange, Mass., The Glidden Co., Chemurgy Div., Indianapolis; Ralston Purina Co., Ry Krisp Div.; General Mills, Inc., Purity Oats Plant, Keokuk, Ia.; Peter Paul, Inc., Philadelphia; The Quaker Oats Co., Depew, N. Y.

DIVISION III

Group A—Carnation Co., Eastern District, Evaporated Div.

Group B—Kraft Foods Co. of Wisconsin, Beaver Dam, Wis.

Group C—Kraft Foods Co. of Wisconsin (seven awards): Hutchinson, Minn., Antigo, Wis., Wausau, Wis., Stockton, Ill., Pinconning, Mich., Los Angeles, and Owenton, Ky.

DIVISION IV

Group A—The Crosse & Blackwell Co., Baltimore.

Group B—40-Fathom Div., National Sea Products Limited, Halifax, N. S.; Anderson, Clayton & Co., Foods Div., Jacksonville, Ill.; Libby, McNeill & Libby, Hammond, Ind.

Group C—Libby, McNeill & Libby (two awards): Selma, Calif., and Leipsic, Ohio; The Larsen Co., Fort Atkinson, Wis.; The C. H. Musselman Co., Gardners Plant; H. J. Heinz Co., Salem, N. J.; California Packing Corp., Mountain States Div., Spanish Fork Plant No. 136; W. N. Clark Co. (two awards): Caro and Holcomb Plants; Morton Salt Co., Newark, Calif.

DIVISION VI

Group A—Bayuk Cigars, Inc. (two awards): Philadelphia, and Webster Div., York, Pa.; General Cigar Co., Mt. Carmel, Pa.

Group B—General Cigar Co., Mahoney City, Pa., Stemmery; Bayuk Cigars, Inc., Leaf Div., Lancaster, Pa.

DIVISION VII

Group A—Brown Forman Distillers Corp., Bottling Div., Louisville.

Group B—Joseph E. Seagram & Sons, Milan, Ind.; Hiram Walker & Sons, Clarke St. Plant, Peoria, Ill.

DIVISION VIII

Group A—Pabst Brewing Co., Los Angeles.

Group B—Carling Brewing Co., Frankenmuth, Mich.

DIVISION IX

Group A—National Biscuit Co., Shredded Wheat Bakery, Niagara Falls, N. Y.

Group B—Interstate Bakeries Corp., Log Cabin Bread Plant No. 20, Los Angeles.

Group C—Interstate Bakeries Corp., Weber Bread Plants (two awards): No. 24, San Diego, and No. 30, Santa Barbara; National Biscuit Co. (six awards): Bread Bakery, Birmingham, Ala., Holland Rusk Bakery, Holland, Mich., Bread Bakery, Plattsburg, N. Y., Milk Bone Bakery, Los Angeles, Cereal Plant, Battle Creek, Mich.; Pepperidge Farm, Inc., Connecticut Ave. Plant; Conlon Baking Co., Charleston, W. Va.

DIVISION X

Plantations—Ewa Plantation Co., Ewa, Hawaii; Kilauea Sugar Co., Ltd., Kilauea, Kauai.

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DIVISION X

Refineries—The Amalgamated Sugar Co., Lewiston, Utah.

FLUID MILK DIVISION

Group A—Carnation Co., Fresh Milk and Ice Cream Div., Seattle.

Group B—Southern Dairies, Inc., Birmingham, Ala.

Group C—Southern Dairies, Inc., (two awards): Asheville, N. C. and Birmingham, Ala.; Detroit Creamery Co., Milk Div. (three awards): Flint, Grand Rapids and Ovid Plants; Central Dairy Products Co., Oklahoma City; Hygeia Dairy Co., Brownsville Unit; Sealtest Sheffield Farms, Div. National Dairy Products Corp. (three awards): Norwich, Hobart and Pennsylvania Districts; Sunrise Dairies, Hillside, N. J.

GLASS AND CERAMICS

GLASS PRODUCTS DIVISION

Group A—Owens-Illinois, Vineland, N. J.

Group B—Ball Bros. Co., Southwestern Div., Okmulgee, Okla.

CERAMICS DIVISION

Group A—Ferro Corp., Cleveland, Ohio, Frit Div.

Group B—American Radiator and Standard Sanitary Corp., Plumbing and Heating Div., San Pablo Plant.

FLAT GLASS DIVISION

Pittsburgh Plate Glass Div., Works No. 6, Ford City, Pa.

MACHINE AND MOLD SHOPS DIVISION

Owens-Illinois, Oakland Central Mold Shop.

MARINE

SHIPBUILDING AND REPAIR DIVISION—PRIVATE

Heavy Yards—Dravo Corp., Engineering Works Div., Neville Island Plant.

Light Yards—The Pittsburgh & Conneaut Dock Co., Conneaut, Ohio; Dravo Corp., Engineering Works Div., Wilmington Plant.

SHIPBUILDING AND REPAIR DIVISION—GOVERNMENT

Group A—New York Naval Shipyard.

Group B—U. S. Army, Corps of Engineers, Missouri River Div.

HARBOR EQUIPMENT DIVISION

The Atlantic Refining Co., Philadelphia; U. S. Army; Corps of Engineers (two awards): Ohio River Div., Southwestern Div.

STEVEDORING DIVISION—BULK CARGO

Toledo, Lorain and Fairport Dock Co., Lorain Docks; Erie Dock Co. (two awards): Erie, Pa., and Cleveland and Crandall Docks.

STEVEDORING DIVISION—GENERAL CARGO

Kauai Consolidated Terminals, Ltd., Lihue, Kauai, Hawaii.

CARGO AND PASSENGER DIVISION—PRIVATE

Ocean and Coastwise—Matson Navigation Co., San Francisco.

Inland Waterways—Nicholson-Universal Steamship Div., Republic Steel Corp.

TANKERS DIVISION

Ocean and Coastwise—Sun Oil Co., Philadelphia.

Inland Waterways—Sun Oil Co.; The Texas Co., Inland Fleet.

CARGO AND PASSENGER VESSELS DIVISION—GOVERNMENT

Military Sea Transportation Service, Atlantic Area, Brooklyn, N. Y.

PETROLEUM

MANUFACTURING DEPT.—ENTIRE COMPANY

Group A—Lion Oil Co., Division of Monsanto Chemical Co., El Dorado, Ark.

Group B—The Ohio Oil Co., Findlay, Ohio.

MANUFACTURING DEPT.—INDIVIDUAL PLANT

Group A—Standard Oil Co. (Ind.), Whiting Refinery.

Group B—The Texas Co., Refining Dept., Lawrenceville Works.

Group C—The Texas Co., Refining Dept., Port Neches Works.

WHOLESALE MARKETING DEPT.

Group A—Continental Oil Co., Ponca City, Okla.

Group B—Lion Oil Co., El Dorado, Ark.

RETAIL MARKETING DEPT.

The Standard Oil Co. (Ohio)

DRILLING DEPT.

Group A—Humble Oil & Refining Co., Houston, Tex.

Group B—Sohio Petroleum Co., Production Dept., Drilling Div.

PRODUCING DEPT.

Group A—Humble Oil & Refining Co., Houston, Tex.

Group B—Lion Oil Co., El Dorado, Ark.

NATURAL GASOLINE DEPT.

Group A—Humble Oil & Refining Co., Houston, Tex.

Group B—General Petroleum Corp.

OIL AND GAS PIPE LINE DEPT.

Group A—Creole Petroleum Corp., Ule-Amuay Pipe Line.

Group B—Mid-Valley Pipe Line Co.

EXPLORATION DEPT.

The Carter Oil Co., Tulsa.

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PAPER INDUSTRY

PULP AND PAPER MILLS DIV.

Group A—Minnesota and Ontario Paper Co., International Falls, Minn.

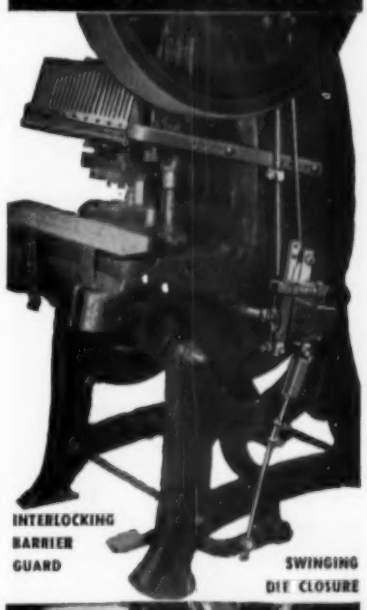
Group B—Crown Zellerbach Corp., Port Townsend Div.; The Munising Paper Co., Munising, Mich.; Georgia Craft Co., Macon, Ga.

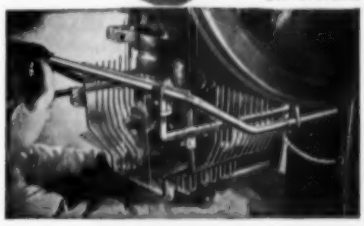
Group C—Falls Paper & Power Co., Oconto Falls, Wis.; Fraser Companies Limited, Newcastle, N. B.

Group D—Owens-Illinois Glass Co., Mill Div., Big Island, Va.; The Mead Corp., Wheelright Div.; Container Corp. of America (two awards): Ogden Mill, Chicago, Chattanooga Mill; Marathon Corp., Ashland, Wis.; Riegel Paper Corp., Hughesville Mill.

Group E—Celotex Corp., Cleveland Plant; Kimberley-Clark Corp. of Canada. Limited, Kapuskasing, Ont.; Flintkote Co., Mt. Carmel, Ill.; International Paper Co., Livermore Mill; United States Gypsum Co., Gypsum, Ohio; Johns-Manville Corp., Tilton Plant; National Vulcanized Fibre Co., Marshall Bros. Plant, Yorklyn, Del.; Spaulding Fibre Co., Hayes Plant; Banner Fibreboard Co.; Wellsburg, W. Va.

JUNKIN SAFETY GUARDS





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PRINTING AND PUBLISHING

Group A—The Lord Baltimore Press, Baltimore.

Group B—Westinghouse Electric Corp., Printing and Publications Division.

PUBLIC UTILITIES

COMBINATION GAS AND ELECTRIC

Group A—Baltimore Gas and Electric Co.

Group B—Wisconsin Public Service Corp., Milwaukee.

Group C—Interstate Power Co.

Group D—Lake Superior District Power Co., Ashland, Wis.; Superior Water, Light and Power Co., Superior, Wis.

GAS DIVISION

Group A—Columbia Gas System, Pittsburgh Group Companies.

Group B—The Peoples Natural Gas Co., Pittsburgh, Pa.

Group C—New York State Natural Gas Corp., Pittsburgh, Pa.

Group D—Water Gas and Sewage Treatment Dept., Duluth, Minn.; The River Gas Co., Marietta, Ohio; Northampton Gas Light Co., Northampton, Mass.; Gas Light Co. of Columbus, Ga.; Winnipeg and Central Gas Co., Winnipeg, Man.

ELECTRIC DIVISION

Group A—Alabama Power Co., Birmingham, Ala.

Group B—Southwestern Public Service Co. (Entire company).

Group C—Tampa Electric Co., Tampa Fla.

Group D—Fall River Electric Light Co., Fall River, Mass.; Upper Peninsula Power Co., Houghton, Mich.; Municipal Electric Lighting and Power Plant, Richmond, Ind.; Nantahala Power & Light Co., Franklin, N. C.; Kingsport Utilities, Inc., Kingsport, Tenn.; Weymouth Power & Light Co., East Weymouth, Mass.; Attleboro Electric Co., Attleboro, Mass.; Old Dominion Power Co., Lexington, Ky.; Loup River Public Power District, Columbus, Neb.; Southern Berkshire Power & Electric Co., Great Barrington, Mass.; Granite State Electric Co., Lebanon, N. H.; Northampton Electric Lighting Co., Northampton, Mass.; Maquoketa Valley Rural Electric Cooperative, Anamosa, Ia.; Central Kansas Electric Cooperative, Great Bend, Kans.; Sand Mountain Electric Cooperative, Ft. Payne, Ala.; Amesbury Electric Light Co., Amesbury, Mass.

WATERWORKS DIVISION

Greenville Utilities Commission; Superior Water, Light and Power Co., Superior, Wis.

RUBBER

Group I—United States Rubber Co., Mishawaka Plant.

Group II—United States Rubber Co., Los Angeles Tire Plant; The Firestone Tire & Rubber Co., Des Moines Plant; The Firestone Tire & Rubber Co. of India, Ltd., Bombay; The Goodyear Tire & Rubber Co., Java Plant.

Group III—B. F. Goodrich Co., Aviation Products; United States Rubber Co., Washington, Ind.

Group IV—American Synthetic Rubber Corp., Louisville, Ky.; Firestone Tire & Rubber Co. (five awards): Akron Synthetic Rubber Div., Memphis Xylos Plant, Magnolia, Ark., Akron Retread Shop; Xylos Rubber Co. of Calif., Firestone Plastics Co., Pottstown, Pa.; The Flintkote Co., Whippany, N. J.; Armstrong Cork Co., Kankakee Plant; Dominion Rubber Co., Limited, Latex and Reclaim Div., Montreal; B. F. Goodrich (six awards): Clarksville Plant, Cadillac Plant, Riverside Plant, Works Technical Group, Marion Plant, Sponge Products Plant 3; Goodyear Tire & Rubber Co. (two awards): Quebec Industrial Center No. 5, Muncie Plant; U. S. Rubber Co. (two awards): Gilmer Plant, Philadelphia, Sandy Hook, Conn.; U. S. Rubber Reclaiming Co., Cheektowaga, N. Y.; Canadian Lastex Limited, Montreal; Gates Rubber Co. of Canada; Lobl Manufacturing Co., Middleboro, Mass.

TEXTILE

DIVISION I

Group A—B. F. Goodrich Co., Martha Mills.

Group B—Safety Clothing and Equipment Co.

GETS-A-LITE GUARD and GUIDE

Quickly and Easily Installed by Anyone — No Tools Needed!

- Simply slip GETS-A-LITE GUARD AND GUIDE over the fixture, as illustrated.
- Made of indestructible spring steel wire. Nothing to break, get out of order or replace. Will last indefinitely.
- Once installed, GETS-A-LITE GUARD AND GUIDE is NEVER removed.
- Nothing to unlock, fuss with or lock, when changing lamps.
- GETS-A-LITE GUARD AND GUIDE actually steers lamp into socket, enabling maintenance man to change lamp in 10 seconds!
- Available for 40 watt and 100 watt fluorescent lamps.

GETS-A-LITE CO. — Dept. NS-47
3865 N. Milwaukee Ave., Chicago 41, Ill.

DIVISION II

Group A—The Chemstrand Corp., Nylon Plant, Pensacola, Fla.

Group B—E. I. du Pont de Nemours & Co., Textile and Industrial Products Research Laboratory.

Group C—Firestone Tire & Rubber Co., Buenos Aires Plant.

TRANSIT

Division I—St. Louis Public Service Co.

Division II—New Orleans Public Service, Inc.

Division III—Nueces Transportation Co.

WOOD PRODUCTS

LOGGING DIVISION

Group A—Weyerhaeuser Timber Co., Longview Lumber Div.

Group B—Weyerhaeuser Timber Co., Snoqualmie Falls Branch.

Group C—British Columbia Forest Products Limited, Renfrew Logging Div., Beach Camp; Oregon Lumber Co., Dee, Ore.; Crown Zellerbach Corp. Columbia Div., Vernonia, Ore.

SAWMILLS DIVISION

Group A—Weyerhaeuser Timber Co., Klamath Falls Branch.

Group B—Weyerhaeuser Timber Co., White River Branch.

Group C—Oregon Lumber Co.

PLYWOOD AND VENEER DIVISION

Group A—Algoma Plywood and Veneer Co., Algoma, Wis.

Group B—General Plywood Corp., Indiana Div.

FURNITURE DIVISION

Kroehler Manufacturing Co. (two awards): Kankakee, Ill., Pittsburg, Calif.

WOOD PRESERVING DIVISION

Group A—Koppers Co. (two awards): Texarkana, Tex., North Little Rock, Ark.

Group B—Canada Creosoting Co., Limited (two awards): Delson and Newcastle Plants; Koppers Co. (five awards): Kansas City, Mo., Alexandria, La., Finney, Ohio, Superior, Wis., Russell, Ky.

COOPERAGE DIVISION

Schenley Distillers, Inc., Chess & Wymond Plant; Calvert Distilling Co., Pine Bluff, Ark.

RETAIL LUMBER YARDS DIVISION

Weyerhaeuser Sales Co., St. Paul; Weyerhaeuser Timber Co. (two awards): Tacoma Office, Los Angeles Yard.

BOX MANUFACTURING DIVISION

The Mengel Co., Winston Salem, N. C.; Potlatch Forest, Inc., Lewiston, Ida.

WOODWORKING DIVISION

Group A—Curtis Companies, Clinton, Ia.

Group B—Western Electric Co., Queensboro Shop; The Marley Co., Stockton Plant; Simpson Logging Co., McCleary Door Plant; American Excelsior Corp., Marinette Div.

WOOD SHINGLES DIVISION

Group A—Canadian Western Lumber Co. Limited, Div. Crown Zellerbach Canada.

Group B—J & M Mills Limited.

FORESTRY DIVISION

Group A—U. S. Forest Service, Lake States Region, Milwaukee.

Group B—U. S. Forest Service (four awards): Southern Forest and Range Experiment Station, New Orleans, Alaska Region, Juneau, Pacific Northwest Forest and Range Experiment Station, Portland, Ore.; Lake States Forest Experiment Station, St. Paul; Weyerhaeuser Timber Co.

PLYWOOD AND VENEER DIVISION

Georgia Pacific Corp., Toledo, Ore.

New Study on Radio Hazard to Blasting

RECENT investigations indicate that the hazard of radio-frequency energy to blasting operations has been greatly exaggerated, according to a report recently approved by the Institute of Makers of Explosives. The booklet, entitled *Radio Frequency Energy—A Potential Hazard in the Use and Transportation of Electric Blasting Caps*, replaces an earlier Institute approved publication on the subject and points out that, "from a practical standpoint, the possibility of a premature explosion due to RF energy is extremely remote."

The pamphlet explains in simple terms the nature of the hazard and precautions designed to minimize it. Two tables of recommended distances are presented for performing electric blasting operations in the vicinity of fixed or mobile AM and FM transmitters. Since many explosives users —especially contractors—operate mobile FM equipment, the minimum distance recommended in the pamphlet for conducting electric blasting operations is only 30 ft. from a 250-watt FM transmitter; 5 ft. from a 10-watt FM transmitter.

In addition, the booklet also describes in detail how to determine the extent of the RF energy hazard in any area. The potential hazard of such types of RF energy sources as microwave relay, radar and Loran are also analyzed.

The booklet, *Pamphlet No. 20*, is available without charge from the Explosives Development Section, Atlas Powder Co., Wilmington 99, Del.

The main influences of the moon are on the tide and the untied.

SPECIFY

Johnson Ladder Shoes

for Safe Climbing

ALL RUBBER
ANKLE ACTION

Always Flat at Any Angle

Standard Equipment in
Thousands of Plants everywhere

JOHNSON LADDER SHOE CO.

EAU CLAIRE, WIS.

PREPARE FOR SUMMER NOW!

It's inevitable that summer's "dog-days" are near and now is the time to buy your Hav-a-Lift Salt Tablets. Only Hav-a-Lift is available in 4 different disposable dispensers and one will definitely fulfill your exact requirements.

Hav-a-Lift coated, regulated Salt Tablets are your most economical buy in Salt Tablets. Write for full particulars and the name and address of the dealer nearest you!

A. E. HALPERIN CO., INC.

BOSTON 18, MASS.

Setol Cleanser HAS WHAT IT TAKES
TO MACHINE-SCRUB OILY FLOORS—

Faster cleaning action!

Cuts operating time of the scrubbing machine

Finnell 213P Scrubber-Vac

Applies cleanser, scrubs, and picks up — in ONE operation!

Because *Setol* is specially compounded for the greater speed of *combination-machine-scrubbing*, it must *and does* work faster than average alkaline cleansers. *Setol* saponifies *and emulsifies* grimy oil and grease *instantaneously*. The wetting agent in *Setol floats the oil* for fast, easy, *and thorough* removal by the vac of a *combination machine* or with a separate vac unit. And because *Setol* stays fast-acting longer—does not spend its strength quickly as do ordinary oil and grease solvents—less is required to clean a given area. Thus *Setol* saves on materials and, by speeding the cleaning process, cuts operating time of the scrubbing machine . . . reduces labor costs . . . and saves on brushes. Best of all, *Setol gets floors oil-free clean!* Also acts as a disinfectant (contains pine oil), and leaves a pleasant, clean aroma.

- **A constant, fast-acting cleanser for machine-scrubbing cement, wood, wood block, metal, stone, and terrazzo floors**
- **Consistent use on cement floors prevents cement dusting . . . provides a finish that helps seal out waste materials**

For demonstration, consultation, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 2205 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

FINNELL SYSTEM, INC.
Originators of Power Scrubbing and Polishing Machines

Everything FINNELL for Floor Care

BRANCHES IN ALL PRINCIPAL CITIES

New
SAFETY EQUIPMENT

Product announcements in this section are reviewed for compliance with the advertising policy of the NATIONAL SAFETY NEWS. Inclusion should not, however, be construed as endorsement or approval by the National Safety Council.

Safety Truck Stair

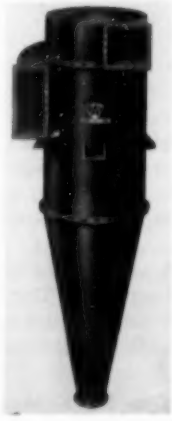
This safety truck stair is designed to reduce accidents that occur when men get in or out of truck beds.

The redesigned stair has a new side latch which provides easy, positive engagement and holds the movable stair in a closed position when not in use. Even under extreme road shock conditions the new latch, with its positive action, will not release.

Stair treads have been redesigned to reduce slippage in wet and icy weather. Each tread is 6 in. deep. The stair is 34 in. x 14 in. and may be attached to the underside of the truck frame either by 4 bolts, or by welding. If the truck is accidentally backed into a loading dock when the stair is extended it automatically slides back under the truck.

The stair is made of welded angle iron and flat steel and all parts are heavily galvanized. It can be adapted for use on stake, van, pick-up, and delivery trucks.

E. D. Bullard Co., 2680 Bridgeway Blvd., Sausalito, Calif. (Item 1)



Centrifugal Dust Separator

The Day "HV" is a low-cost, high-efficiency centrifugal dust separator. The path of the dust-laden air traveling through the "HV" encounters a minimum of turbulence due to the scroll inlet and air foil design inlet vane, and a steep, smooth cone assures uniform and quick delivery of the dust to the dust outlet.

The separator has many uses. The scientific design and durable construction permit handling of fibrous, granular, abrasive, fine or coarse dusts at normal or high temperatures. It can be used on pressure or vacuum and stainless steel units are available. There are 20 standard sizes, and groupings of any sizes can be furnished to handle any volume of air from 150 cfm. upwards.

The Day Sales Co., 810 Third Ave., N.E. Minneapolis 13, Minn. (Item 3)

Helmet-Face Shield Headgear

G1-R headgear for helmets and face shields permit easy, comfortable fitting, and adjust to a required head size by a turn or two of the adjusting ratchet.

The new headgear is available in a choice of long-wearing, high-impact vinyl compound or fiber. It is impervious to perspiration or chemical action and cleans easily.

Chicago Eye Shield Co., 2506 Warren Blvd., Chicago 12, Ill. (Item 2)

Latex Industrial Gloves

A wide selection of industrial gloves made from genuine liquid latex features high tensile strength. They remain pliable and comfortable after hard, continuous service. Wil-Gard latex gloves are resistant to most common industrial gases, chemicals and acid solutions.

A variety of styles are available, including latex general purpose gloves, white latex surgical-type gloves for precision work, tan and natural color "Kanry-Tex" latex gloves that are reinforced for extra strength in fingers and palms, tan latex tan-

ners' mittens in fingerless and one-finger models, and latex thumb and finger cots.

The gloves are made in lengths from 11 to 12 in. and in light, medium and medium-heavy weights. Sizes range from 7 to 11 and smooth and firmhold finishes are available.

The Wilson Rubber Co., Industrial Div., 1200 Garfield Ave., S.W. Canton 6, Ohio. (Item 4)

Salt Tablets— Disposable Dispenser

"Pep-Up" impregnated and enteric type salt tablets are now packaged in colorful, high-impact, styrene plastic expendable "throw-away" dispensers. The red, white and blue plastic dispensers, in 500 and 1,000 tablet sizes, are sanitary, eye-appealing factory sealed units.

They are designed for all-weather use, inside or out, and can be quickly installed and replaced. They can be mounted on walls, posts, water-kegs, vehicles, etc. The plastic dispensers replace cardboard throw-away dispensers.

U. S. Safety Service Co., 1215 McGee St., Kansas City 6, Mo. (Item 5)

Hydraulic Die Handler

A manually-operated hydraulic lift especially designed to simplyify the handling of dies and similar loads in industrial plants is available in either 500-lb. or 1,000-lb. capacities. The E-Z Lift has a special die-handling table. Instead of the conventional steel platform, the table is fitted with 6 easy-turning, full-width rollers. In operation, the lift is moved into position at the machine or in the die storage area; the table is elevated to the proper height, and the die is rolled into the proper position on the table for moving. The front of the table has an adjustable steel retainer to securely and safely keep the die on the lift during moving.

Features of the lift include easy-to-operate hydraulic lifting mechanism, automatic protection against overloads, safety guards and maneuverability.

Crown Controls Co., Inc., New Bremen, Ohio. (Item 6)

Safety Floor Mat

"V" rib rubber mats remove dirt from shoes with a "windshield wiper" action. Made from live rubber, the mat consists of flexible, heavy duty "V" shaped ribs which scrape dirt, slush and mud off shoes. The ribs also serve as a dependable friction surface to prevent slipping or sliding.

The "V" rib design is available in a straight horizontal pattern called "cross rib runner" or in a horizontal-vertical checker board pattern under the name "Shad-O-Rug." In addition to live rubber, the mats are also available in grease, chemical and oil proof NIRU in a number of colors.

Wear Proof Mat Co., 2156 Fulton St., Chicago 12, Ill. (Item 7)

Safety Solvent

Vythene-E is a highly refined grade of 1,1,1-Trichloroethane. It is a specially purified grade of vythene which has a low percentage of nonvolatile material and a boiling range narrower than that of commercial 1,1,1-Trichloroethane.

Because of the low percentage of residue, vythene may be used for cleaning oxygen-bearing equipment, highly sensitive electronic parts and for many extraction and pharmaceutical purposes. It is also a recommended cleaner for precious metal contacts used in radio and television transmitting.

Vythene-E is approximately 20 times less toxic than carbon tetrachloride and has no flash point. In addition, the product is stabilized to all metals including aluminum and can be successfully reclaimed by distillation in this manufacturer's automatic Teeter-Still.

The product is available in drum quantities.

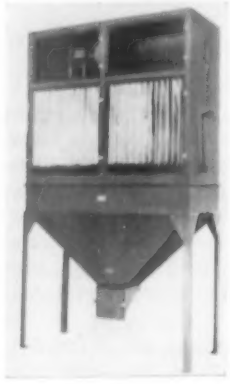
Tect, Inc., Cortland and Erie Sts., Dumont, N. J. (Item 8)

Hexachlorophene Powdered Hand Soap

Formula No. 99 hexachlorophene powdered hand soap is now available in a new container dominated by a large white hand. The product, used to remove industrial soil, is available with either borax or vegetable heavy-duty scrubber. The borax type box is printed in black and coral, while the other is in black and green. Both contain 5 lbs.

The product is available in cases of 10, 5-lb. cartons and 175-lb. drums. Regular washing with Formula No. 99 is said to destroy up to 95 per cent of the skin bacteria that spread contact dermatitis and cause infections.

Armour & Co., Industrial Soap Dept., 1355 W. 31st St., Chicago 9, Ill. (Item 9)



Dust Collector

Model No. 123 dust collector handles heavy-duty continuous grinding and other high dust volume sources.

Handling as many as 8 grinding wheels at one time, Model 123 has a dust storage capacity of 10 cu. ft. and a filter area of 300 sq. ft. Its 5 hp. motor moves approximately 2,000 cu. ft. of air per minute through an 8-in. inlet at speeds of more than a mile a minute. Static pressure for this inlet is 3½ in. water.

The cloth filters are chemically treated for spark resistance and are sealed against leakage. Filters, motor and blowers are easily reached through removable doors. The motor is internally mounted in the clean air stream above the filters. A manual starter with overload protection is standard equipment, while explosion-proof motors and magnetic starters are available at extra cost.

Torit Mfg. Co., Dept. KP, 287 Walnut St., St. Paul 2, Minn. (Item 10)

Heavy Duty Coil Racks

Portable, heavy-duty racks especially adapted to the handling of coils of any length, weight or thickness hold steel, copper, aluminum, brass or any other material in coils of various sizes. The units may be stacked in tiers to any height using automatic tongs suspended from an overhead crane or by use of a fork lift truck.

Individual coils may be removed from the rack without disturbing the balance of the stock. Double thickness lifting lugs are welded to the uprights and the racks have heavy-gauge steel stacking brackets welded to the corners of the uprights.

Palmer-Shile Co., 12643 Mansfield, Detroit 27, Mich. (Item 11)

"Musketeer" Headrest

The "Musketeer" headrest offers a choice of four types of face shield visors which fasten to the front of a wide spark deflector, pivoted to the headband. The headband and adjustable cross strap are one-piece molded nylon and the headband is fitted to the head by a large, winged knob and gear also of nylon. Nylon friction pivots adjust while the shield is in use, locking it at any position or allowing free up and down movement.

The "Musketeer" is available with: (left) a fiber visor with welding lens for scarfing, furnace work and heavy gas welding; (2) a metal-bound plastic visor in various depths, and (3) a wider, all-plastic visor, both in clear plastic and in shades of green, for use in metal pouring and finishing, spot and flash welding, woodworking, etc.

At the right is a 24-mesh wire screen visor, recommended for furnace work and drop forging.

Jackson Products, Inc., Div. Air Reduction Co., 31739 Mound Rd., Warren, Mich. (Item 12)

Safety Turn Bar

The "Super-R-Guy" safety turn bar is a tool that can be used in place of dangerous homemade pinch bars for turning steel plates and shapes.

The bar is especially suited for shop or yard use where hoist and crane facilities are inadequate or overloaded, warehouse operations and for handling steel on the job site. The chisel end of the bar is useful for separating closely stacked plates and shapes.

The safety turn bar makes the job easier and safer and is said to help cut handling time and costs. The tool is useful in shipyards, railroad car rebuilding and repair shops, steel warehouses and other locations with similar steel handling problems.

Guibert Steel Co., P. O. Box 4342, Pittsburgh 4, Pa. (Item 13)

Truck Crane

The Truck-Crane requires only 18 in. of space behind the truck or tractor cab, and leaves the entire body free for payload area. The power for the truck-crane is hydraulic in all phases of operation. The boom swing is 280° and it projects or retracts hydraulically in a horizontal position or at any point up to an 85° elevation. Both horizontal and elevating-type booms are available, and the capacity is 5,000 lbs.

Control levers are on both sides of the truck. One lever provides forward, reverse, locking and speed control for each power movement. The valve bank, which locks automatically when levers are released, has a relief valve for prevention of overloading and subsequent damage to equipment. The high pivot point of the boom on the mast permits high loading right up against the crane superstructure. Boom "topping" capacity is equal to winch load line capacity. Stability is provided by standard hydraulic outriggers.

Anthony Co., 1750 Baker St., Streator, Ill. (Item 14)

Shock Absorbing Handles

Shock-absorbing handles for hand-held rock drills absorb recoil and vibration. The handle also reduces operator fatigue. Vibration is absorbed by rubber cushions incorporated into the mechanism of the new handle, which was designed for use with this manufacturer's H-10, H-12, and H-111 sinker drills. A handle adjustment can be made to suit the operator's desired degree of vibration dampening.

The new shock-absorbing handle is standard equipment on the three drills listed above and modification kits are available for equipping former models of these drills with the new handle.

LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis. (Item 15)

Safety Spectacles

Lightweight safety spectacles which may be used for semi-hazardous operations as well as for the protection of visitors to in-plant locations are available in either clear or dark green and are molded of .060 in. thick impact-resistant plastic. The attractively styled frames have spatula temples and will fit any face with a minimum of adjustment. The spectacles may be worn comfortably over prescription glasses.

They are designed for light grinding, spot welding, laboratory and other similar light-hazard uses.

General Scientific Equipment Co., 7516 Limekiln Turnpike, Philadelphia 50, Pa. (Item 16)

Insulating Link

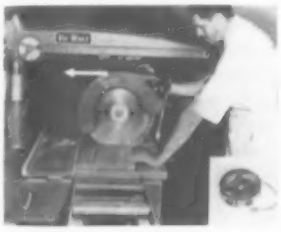
An insulating link replaces standard crane end connections with insulated connections capable of withstanding 100,000 volts. Crane booms or load lines that accidentally come in contact with energized overhead wires are said to no longer cause injury. The links are available for immediate delivery in both 6.8 and 8.5 ton sizes with various types of end connections.

General Machine & Welding Works, Inc., 1100 East 2nd St., Pomona, Calif. (Item 17)

Smokescope

This smokescope offers a reliable method of checking density from suspected smokestacks. It is a precision built optical instrument that makes accurate, dependable and reproduceable estimations of the density of smoke. The instrument minimizes error resulting from variations in background and ambient light and is said to eliminate the need to change focus of eyes in looking from the smoke to reference charts.

Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Calif. (Item 18)



Safety Tool Return

Safe retraction of potentially dangerous tool heads can be provided by this safety return device. It exhibits no excessive build-up of the restraining force despite long extension.

As shown in the illustration, the self-contained standard unit consists of a special spring with a fully enclosed housing, a cable reel, cable and a threaded mounting stud. A socket head screw for attaching both the housing and the free end of the cable, and a socket wrench can be included with the standard device.

When properly installed, the spring offers negligible resistance to extension of the tool but will positively retract it to the neutral position upon release. The device provides a minimum retracting force of 5.5 lbs. and a maximum of 9.3 lbs. through an 11-ft. total extension.

Spir'tor Div., Hunter Spring Co., 1 Spring Ave., Lansdale, Pa. (Item 19)

Boarhide Industrial Gloves

Flexibility, long wear and high abrasion resistance are features of these industrial gloves. The manufacturer says that tests indicate that the gloves provide a two to one wear quality over conventional leathers. Natural properties of Boarhide, combined with a special tanning process have provided a glove possessing great flexibility. In addition, the full cut, seamless palm and full leather wing thumb provide an extra comfort and safety to the wearer.

They are made of three basic styles: safety cuff, gauntlet, and knit-wrist patterns. All styles have seamless leather index finger, leather tops welted thumb crotch, forchette seams, lined palm and blue grey cotton flannel backs. They can be safely dry cleaned.

Wearhide Glove Co., Rockford, Mich. (Item 20)

Magnesium Ramp-Dockboard

A magnesium combination ramp-dockboard can be used where a long approach is necessary to compensate for large height differentials between the dock and the carrier floor. Is is also recommended for jobs where low underclearance problems require a long, gentle slope.

Because the unit is built in two detachable sections, it is easier to handle than heavy, extra long dockboards. The weight advantage of magnesium combined with the two section design makes it possible for a single man to move and position the dockboard.

It is available for both truck and freight car loading and the unit consists of a ramp section—permanently elevated on one end — and a standard dockboard section. The two sections are firmly locked together and held in place by a positive positioning device.

The standard unit is available in capacities up to 12,500 lbs. axle loading and is completely fabricated of magnesium with safety tread surfaces and ample underbracing.

Lite-Line Industries Div., Copperloy Corp., 4111 Brookpark Road, Cleveland 24, Ohio. (Item 21)

Rubber Floor Mats

"Airstrip" is a ½-in. thick rubber runner made in interlocking sections. The mats keep the user off hard, damp, cold floors and insulate the feet with cushions of warmth-retaining air space. The matting is resilient and may be used at assembly benches, in factories, etc. Mats are available in black, red, green or blue and come in regular rubber, special grease and oil-proof, chemical and acid resistance rubber, and solid regular rubber.

The units may be locked together to form desired lengths.

Mitchell Rubber Products, Inc., 2114 San Fernando Rd., Los Angeles 65, Calif. (Item 22)

"Ear-Loks"

"Ear-Loks" hold plastic safety frames comfortably and permanently in the correct position. They are made of a soft, elastic, transparent plastic composition and reduce the hazards involved when glasses tend to slip down on the nose. The "Ear-Loks" are invisible when worn and each pair provides long, satisfactory service.

Dorsay Products, 2 Columbus Circle, Broadway at 59th St., New York 19, N. Y. (Item 23)

Stainless Steel Cans and Pails

Stainless steel cans and pails, recommended for use where health and sanitation requirements are rigidly enforced, are designed for food and chemical processing, pharmaceutical manufacturing, canneries, meat packing, laboratories, etc.

The pails and cans are constructed of 24 gauge type 304 stainless steel with a 2B finish. They are equipped with ⅛ in. x 2¼ in. stainless steel plain bands at the top and bottom. Snug-fitting lids lock out foreign matter. The cans are available in 12¼, 16, 20, 27 and 33-gal. sizes and the pails are sized in 5, 7, 8¼ and 10-gal. capacities.

The Witt Cornice Co., 2121 Winchell Ave., Cincinnati 14, Ohio. (Item 24)

Finger Guard

Greater safety and freer finger movement are claimed for this new seamless finger guard.

It is especially suited to assembling, electrical spotting and handling small parts. The new guards are made of high quality plastic, and are fully lined with snug-fitting, perspiration-absorbent cotton. The guards come in both men's and women's sizes and offer excellent fit, greater strength and longer wear.

Advance Glove Mfg. Co., 901 W. Lafayette Blvd., Detroit 26, Mich. (Item 25)

Underground Ventilating Heater

This new ventilating heater is designed especially for year 'round underground operations. It operates on either a.c. or d.c. from portable generator power to a 110-volt power tap. Model ACM (or DCM) ventilating heater furnishes a constant supply of forced fresh air to manhole workers and helps prevent accidents caused by explosions or oxygen deficiency and enables the workmen to work with greater speed and safety.

Both models are portable, weigh 70 lbs. and blow from 300 to 800 cfm. of fresh air for summer operations. In winter, when warm air is desired, the units are ignited by spark ignition. The automatic spark ignites a 45,000 B.T.U. propane burner which can be controlled to give a 10° to 90° temperature rise in the manhole.

The ventilating heaters are best suited for telephone, telegraph, electric, water and gas utilities underground operations. They have an additional outlet at tank pressure for lead furnace operation.

An automatic gas shut-off valve is an added safety feature to cut off gas in the event of power or burner failure.

Morrison-Pelsue Co., Dept. B, Box 8328, Denver, Colorado (Item 26)

Nonflammable Solvents

Nonflammable solvents that will remove oil, grease and dirt without harming delicate metal parts or electrical insulation are safe enough to use in ordinary work areas with conventional ventilating equipment. They are adaptable to vapor degreasing or cleaning by liquid immersion and are classified technically as "selective solvents."

The advantage of the solvents rests in their safety, both from a personal exposure and a material standpoint. Because they are nonflammable and nonexplosive they can be used in open shop areas without danger of fire.

In addition, from an inhalation toxicity standpoint, they are rated as the safest of the commonly used nonflammable solvents when used in properly designed equipment which minimize vapor losses.

They are suitable for cleaning electrical motors, electronic instruments, photographic and sound recording films and tapes, oxygen breathing apparatus, etc. The "Freon" solvents also have proved useful as general laboratory equipment cleaners and as safe, efficient heat transfer agents in place of flammable and explosive acetone in low-temperature laboratory chill baths.

Three types of the solvents are now available—"Freon" MF, with a boiling point of 75 F.; "Freon" BF, which boils at 199 F., and "Freon" TF, whose boiling point is 118 F. The range makes the "Freon" solvents adaptable to use in many types of mechanical cleaning equipment.

E. I. Du Pont de Nemours & Co., Inc., 7506 Nemours Blvd., Wilmington, Del. (Item 27)

Industrial Spectacles

"Magnasite" industrial spectacles feature an improved design of square shaped lenses that provide a larger viewing area. The frames are made from clear plastic, with a spatula temple, and are lightweight and impact resistant.

They are available in four lens sizes and four bridge sizes. A choice of clear or green hardened glass lens or clear or green "Amerilite" lens is available. Clip-on-side-shields are also available.

American Industrial Safety Equip. Co., 3500 Lakeside Ave., Cleveland 14, Ohio (Item 28)

Power Sweeper

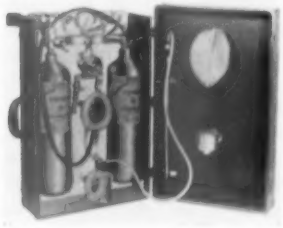
Better dust control, a wider sweeping path and hydraulic dumping are features of this power sweeper. Model 80 sweeps a 42-in. path (53 in. with sidebrush) and is especially designed for sweeping factory aisles, warehouses, hangars, parking lots, garages, etc.

The sweeping capacity exceeds 110,000 sq. ft. an hour in open areas and it picks up all types of soilage—from powdery dust to bulky litter. The improved dirt pick up and dust control result from a specially engineered brush-and-vacuum system. A revolving 42-in. main brush throws dirt, debris and litter directly forward into a 12 cu. ft. dirt hopper.

The floating type hopper rises when bulky litter is encountered allowing on-the-run sweep-up of large objects without interruption. A high-volume vacuum fan sucks dust from the sealed-to-floor brush compartment, "trapping" it in a large fabric bag.

A double clutch eliminates manual gear shifting and permits instant change from forward to reverse.

G. H. Tennant Co., 721 North Lilac Drive, Minneapolis 22, Minn. (Item 29)



Resuscitator Inhalator Respirator

The "Reviv-A-Life" resuscitator is an automatic breathing machine which will safely and rhythmically inflate and deflate human lungs. All oxygen controls for regulating resuscitation or inhalation are in the control valve which may be held in the hand. This feature enables one operator to service the patient at a distance from the supply tanks.

The new Venturi Action eliminates the spring and toggle mechanism and reduces service requirements. The unit is mounted on a removable aluminum panel and weighs only 35 lbs., including two "D" tanks.

Midwest Oxygen Equip. Co., 1664 W. Ogden Ave., Chicago 12, Ill. (Item 30)

Protective Apparel in Polyethylene Bags

Leather clothing, aprons and sleeves are now packed in polyethylene bags. The bags keep the items clean, aid in identification, and permit them to be displayed on shelves without getting soiled.

New lightweight clothing has also been developed for use on Heliarc and Inert welding. The clothing is said to weigh half as much as regular clothing and enables the worker to stay on the job longer with less fatigue.

Aljay Mfg. Co., Inc., 1516 Callowhill St., Philadelphia 30, Pa. (Item 31)

Inert Gas Arc Welding Glove

This black glove gives high protection against ultraviolet rays. The "Black Beauty" is made of cowhide, tanned to give it unusual resistance to heat shrinkage. Its softness and light weight make it comfortable to wear. The glove is fully lined, has a wing thumb, one piece construction and leather welted seams at the points of greatest wear. This combination is comfortable and adds life to the glove. It is well adapted to all types of welding.

Singer Glove Mfg. Co., 860 W. Weed St., Chicago 22, Ill. (Item 32)

NEWS ITEMS

ROBERT D. JAFFEE

The Oil-Dri Corp. of America, manufacturer of oil absorbing floor compounds and nonslip paints, has announced the appointment of Robert D. Jaffee as vice president and controller.

Mr. Jaffee will head the finance and production departments of the company.

Ansul Chemical Co. will offer advanced training in fire-fighting techniques for the 11th consecutive year. A series of 12, three-day courses will open May 20 at Ansul's 10-acre proving ground in Marinette, Wis. Classes will extend through the summer with the final session scheduled to begin September 30.

Trainees will work with all types of Ansul dry-chemical fire fighting equipment. The courses are open to industrial plant safety personnel, fire marshalls, municipal and military fire fighters and other interested personnel.

The classes are limited to 25 men each and reservations may be made through Ansul salesmen and distributors or by writing to the Ansul Chemical Co., Marinette, Wis.

EMALFON®
—SINGER'S *Patented
INSULATED GLOVE

A new kind of glove—so different it's patented—ideal on hot jobs that do not exceed 700 degrees. Made with three thicknesses of material: Outer layer of terry cloth, treated to make it flame-resistant; inner layer of all-wool for added insulation; third layer (next to skin) of soft, fleeced cotton. This combination gives flexibility and long wear.

In many cases it has replaced asbestos gloves at a big saving. Fine for extra warm welding jobs.

If not available from your safety equipment dealer, write us for complete information and prices.

NEW CATALOG—just off the press!

SINGER
GLOVE MFG. CO.
850 W. WEED ST. CHICAGO 22
"Work Gloves That Sing"
*Patent No. 2,650,365

Self-Sticking Safety Signs

Unskilled help quickly puts up Brady Safety Signs—without nails, screws, or tools. They stick and stay stuck to any surface.

The signs you need are among the 500 different Brady Self-Sticking Accident Prevention Signs. Wordings, colors, and sizes are recommended and approved by ASA and NSC. Write for free samples and Catalog 145-D.

Self-Sticking Warning Stripes are applied fast — right off the roll. Stripes in 2 sealed-in plastic colors. Outlast paint. Write for free samples and Bulletin 143-A.

Fast delivery. Distributors in 150 cities.

W. H. Brady Co. 43
780 W. Glendale Ave., Milwaukee 9, Wis.

Plant Committee Checks V-P's Home for Hazards

IN PROMOTING off-the-job-safety, the people at Simpson Paper Company, Everett, Wash., believe in starting at the top. The accompanying illustration shows Lois Malecki and Herb Somes of the plant safety committee calling on Mrs. D. F. McCall, wife of the firm's vice-president and general manager. The purpose of their visit—to inspect the McCall household, which they later approved as a safe dwelling place.

Another off-the-job activity at Simpson is a home safety inspection form, which has been mailed to all employees. Mill workers have an added incentive; they can, by completing the check list, add to their department's "Safety-rama" score by upwards of 25 points.

Chemstrand

—From page 34

times and two full-time plant physicians are always on call.

The medical section also gives a periodic physical examination to each employee as well as the pre-employment physical. Physical standards are high and take into consideration the work the employee will be doing.

Personal protection. Much emphasis is placed on the wearing of safety glasses which the company furnishes without cost to the employee. For prescription glasses the employee pays only the cost of the eye examination.

A registered optometrist is retained to assure proper fitting. Eye protection is required at all times in operating buildings in the intermediate chemical areas and in yarn plant operations. Splash protection or welding goggles are worn as necessary.

Red floor lines—like the one which warned a former company president—clearly mark the eye protection areas. They have become a reminder—almost a symbol—of the whole safety program.

To add first-hand emphasis to the plant's insistence on eye protection, a chapter of the Wise Owl Club has been formed. Nine employees whose eyes have been saved by protective equipment are members.

Respiratory protective equipment, including dust and fume respirators, masks, and self-contained breathing apparatus for specific atmosphere contaminants are maintained and specified for various operations.

Acid protection clothing includes gloves, coveralls, jackets, hoods, and boots.

Safety shoes, stocked in a variety of styles for both men and women, are sold at cost on payroll deduction. Some 90 per cent of the employees buy and wear these shoes.

For hand protection in certain areas there are asbestos, cloth, leather, and steel mesh gloves.

Standby emergency equipment includes safety showers, stretchers, fire blankets, gas masks, and fire protection equipment—all spotted at frequent and accessible locations through the plant.

Plant design. In designing the plant, safety was a paramount consideration. Adequate working space and aisles wide enough to prevent congestion, adequate levels of glare-free lighting, correct and safe tools and machine guards are all provided.

Washrooms and locker rooms designed and equipped according to modern standards are maintained at a high level of cleanliness. Housekeeping is almost a fetish here and the most zealous

housewife would be proud of a home as spotless as the production areas of this plant.

The yarn plant is completely air conditioned by one of the largest systems ever installed in a factory. Inside air is even more dust-free than the widely advertised Florida atmosphere.

Instrumentation. One of the significant factors in the plant's safety record is the high degree of instrumentation built into the processes.

Although human minds and hands guide complicated chemical reactions in the maze of vessels and piping, elaborate electronic or mechanical "brains" keep close check on the processes. A chemical batch which exceeds pre-set safety limits is dumped automatically and with split-second swiftness into emergency dump tanks a safe distance underground.

The very nature of the basic materials converted into nylon provides an indirect tribute to the design of the plant, the carefully developed techniques and the safety consciousness of the people who operate the plant. Those basic materials include such sometimes cantankerous chemicals as cyclohexane, ammonia, caustic soda and phosphoric acid. And in the processes great quantities of nitric acid are manufactured.

It is significant that out of the relative handful of disabling injuries which have occurred since the plant began operation in late 1953, only one was from actual chemical contact. That injury was to a maintenance man who received relatively minor ammonia burns.

Keeping the program alive. A constant flow of safety reminders and reading material is made available to employees through regular plant publications and in the reading racks. A library of safety films and reference material is kept up to date and readily available.

Important safety reminders are the posters. These are designed and prepared in the plant to meet specific conditions and objectives.

Safety suggestions are actively encouraged from all employees. These are always acknowledged and given careful study by management.

To put safety on a competitive level, contests are held. Cash prizes or merchandise are awarded to winners.

Emphasis is given to plant safety goals and as each man-hour milestone is passed, appropriate and worthwhile awards are made.

Dinners "on the house" marked the two previous times the plant chalked up more than two million man-hours and the three million man-hours on the current record.

When the four million mark was passed, each employee received a quality leather wallet. At eight million, each employee got his choice of several prizes, such as a fishing reel or a hair dryer.

And for setting a new world's record they had their choice of an Acrilan blanket (made from fiber manufactured by Chemstrand at Decatur, Ala.), a fine pen and pencil set, or several other prizes with a retail value of about $15.

Around the plant "break time" conversation often includes speculation on what prizes will be awarded when they beat the all-industry world's safety record.

But welcome as prizes may be, they alone would hardly have provided the incentive for the plant's accomplishment. As Plant Manager Frank Gronemeyer sums it up:

"We feel that these prizes do offer zest and encouragement in our joint efforts to set new safety records, but like our record for a product of unsurpassed quality the moving spirit behind it all can best be summed up with 'teamwork.'"

"Okey, Shorty . . . got your safety hats on?"

Soap and brush action without any brush

Borax scrubber in Prolax powder acts like millions of fine tiny brushes. Makes stubborn grime vanish quickly.

Its hexachlorophene, through regular use, builds an invisible film on the skin that reduces by as much as 95% the resident bacterial population.

Correct for both shop and office; popular with both men and women.

Protect your valued employees from dermatitis with this heavy duty cleanser that is so kind to the skin.

For free sanitary survey of your premises ask your Dolge service man

Dependable DOLGE WESTPORT, CONNECTICUT

COTTERMAN

WELDED STEEL SAFETY LADDERS

For Filing Rooms — Stock Rooms — Vaults

SAFE
•
STRONG
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EASY TO MOVE
•
EASY TO CLIMB
•
NON-SKID STEPS

Frame work made from heavy gauge 1" diameter round steel furniture tubing, with all joints electrically welded. Mounted on Swivel Brake Casters which allow the ladder to be rolled freely when no one is on it. When you step on the ladder the rubber cushioned legs rest on the floor and prevent rolling.

Made in 13 heights—from 12" 1 Step to 117" 13 Step, and in 4 widths—18", 20", 26" and 32", with and without hand and platform rails.

We also manufacture the

COTTERMAN TRUCK - N - LADDER

A Truck and Ladder combined in a single unit.

Write for Folder No. 56-N for complete information and prices on both these items.

Manufactured by

I. D. COTTERMAN

4535 N. Ravenswood Ave. Chicago 40, Ill.

TRADE PUBLICATIONS

These trade publications will keep you up-to-the-minute on new developments in safety equipment and health products. All catalogs are free, and will be sent without obligation. Just circle publication number on the Reader Service Postcard.

1. Safety Shoes: A new 1957 catalog four-color, thirty-two pages describes and illustrates over ninety Hy-Test Safety Shoe styles, available in more than 6,500 different designs, lasts, sizes and widths. Included in the catalog are the newest additions to the 1957 line such as the Flat-tred Wedgie, the Insulated Shoe, the Wellington Boot and the Cush'n-Guard Flap Shoe. Safety oxfords, shoes and boots are grouped into separate sections, and there is a special section for women's safety oxfords. Two new and unique "Facts about Features" charts have been added to the catalog. These make it possible to learn quickly, at a glance, which safety shoes are available in a specific style, for a special use or with any certain feature. The catalog is bound in a convenient file holder. Hy-Test Safety Shoes, Division of International Shoe Company, 1509 Washington Ave., St. Louis 3, Missouri.

2. "G-11 (Hexachlorophene USP): Sindar Corporation, has just published a supplement to its Technical Bulletin H-1 entitled "G-11 (Hexachlorophene USP) An Annotated Bibliography. The Supplemental Bibliography appears in the Sindar Reporter Number 1—1957 and includes abstracts of 28 articles and 1 patent. An index to the Supplemental Abstracts similar to the one used in the original technical bulletin has also been published in order to give the readers easy access to any particular subject of interest. Sindar Corporation, 330 West 42nd St., New York 36, New York.

3. First Aid: Valuable first aid and field protection advice as well as detailed information on unit system first aid kits and components are featured in this 32-page plastic bound book. Information ranging from proper snake bite treatment to a chart showing correct unit system kits and supplies for various industries is included. Products listed in the catalog include flexible unit first aid kits, specific application kits, bandages and compresses, eye dressings, antiseptic swabs and applicators, poison ivy treatments, salt tablets, snake bite and burn first aid kits, and many other first aid items. Medical Supply Company, Rockford, Illinois.

4. Materials Handling Products: A new, omnibus broadside illustrating and describing its full line of "Lifetime" materials handling equipment has been published by Elizabeth Iron Works, Inc. Featured are all-steel ramps, motor and trailer truck ramps, all-steel pallets, "Dubl-Duty" Conversion Kits. Specifications for all these ramps are shown, modifications described where available. Elizabeth Iron Works, Inc., Box 360, Elizabeth, N. J.

5. Bridge Cranes: A comprehensive and information-packed folder, describing the B-47 Hand Traveling Crane which is available in capacities of three tons to 10 tons with spans up to 50 feet has been made available. This 4-page folder, Bulletin DH-459A, contains data on construction details, weights, dimensions and other general information of interest to plant engineers. This Crane, when combined with the Wright double beam trolley and hoist, or with the manufacturer's double beam electric trolley hoist, makes an excellent installation for many industrial applications where spotting of load is more important than fast travel speed. Wright Hoist Division, American Chain & Cable Co., Inc., York, Pa.

6. Rubber Floor Pads: A new catalog sheet, illustrates and describes the company's line of Flex-O-Rubber Floor Pads. The pads, which may be installed on the floor or recessed into specially built floor pockets, are designed to protect products and prevent damage to floors by absorbing the shock from falling loads. This may be used in production or assembly areas, on loading docks, and the like. Bumpers, Inc., 2534 Detroit Avenue, Cleveland 13, Ohio.

7. M-S-A Continuous Carbon Monoxide Analyzers: A four-page folder describes company's line of continuous carbon monoxide analyzers, adaptable to any set of individual requirements. The analyzers, which detect the accumulation of dangerous gas concentrations, are specially effective in metallurgical plants, vehicular tunnels and garages, coke oven and gas manufacturing plants, test chambers, heat treating operations and chemical processes. Making use of an extremely simple reaction to measure CO concentrations, these analyzers are fully automatic —providing uninterrupted monitoring with an absolute minimum of supervision and maintenance. Mine Safety Appliances Company, 201 N. Braddock Ave., Pittsburgh 8, Pa.

8. Grading and Treads: Bulletin No. 2527, presents descriptions on electroforged, riveted, rectangular, diagonal, "U" type and "T" interlocked grating and treads. Tables on safe loads and information necessary to specify are also included. Blaw-Knox Company, Grating Dept., P. O. Box 1198, Pittsburgh 30, Pa.

9. "How to Select a Fire Extinguisher Chart": A new chart, available lists basic types of extinguishers and shows at a glance which to use against the three classes of fire: Class A—wood, paper, rubbish, etc.; Class B—volatile liquids; Class C—electrical fires. Effects of temperature, the operating ranges for each type of extinguisher, how the various extinguishing agents kill fire,

and other information on extinguishers are included on the chart. Fire Equipment Manufacturers' Assn., Inc. Suite 759, One Gateway Center, Pittsburgh 22, Pa.

10. Gripper Slings: 18-page catalog illustrates and describes company's line of slings in detail, gives typical applications and also contains complete price information. The Cambridge Wire Cloth Co., Cambridge, Md.

11. Floodlighting: A new catalog illustrates company's entire line of aluminum floodlights. 12 pages are taken up with cast aluminum vaportight perdant, ceiling and wall fixtures, 8 pages with wiring troughs, splice boxes and other outdoor fittings, and 17 pages with sealed-beam floodlighting lampholders. Complete lighting performance tables are included for the new high efficiency long-throw PAR-46, PAR-56 and PAR-64 500 watt power-beam projector lamps in narrow spot, medium and wide flood. Stonco Electric Products Co., Kenilworth, N. J.

12. "How to Select the Best Self-Adhesive Pipe Marking Materials": This 8-page catalog lists over 500 self-adhesive Vinyl plastic pipe markers carried in stock by manufacturer. Self-adhesive cut-out numbers and letters and stock safety slogans widely used by Safety Engineers are completely illustrated. Many other self-adhesive products used by Plant Maintenance and Safety Engineers are discussed in this catalog. Printed Cellophane Tape Co., 521 N. La Brea, Los Angeles 36, Calif.

13. Marine and Industrial Hardware: The first catalog illustrating and describing the complete line of BTC Drop-Forged Marine and Industrial Hardware has been made available. Included in the 28-page catalog are positive-lock safety hooks, grab and clevis grab hooks, slip and clevis slip hooks, eye, swivel and shank hoist hooks, Portland and Seattle cargo hooks and safety snap hooks. In addition, the catalog illustrates anchor and chain shackles, turnbuckles, open and closed wire rope sockets, elevator socket bolts, wire rope clips, yoke and rod ends and regular, plow steel or heavy wire rope thimbles. Blueprints and specifications on each item are included. Marine and Industrial Hardware Division of the Brewer-Titchener Corporation, Cortland, N. Y.

14. Linemen's Rainsuits: This 1957 catalog offers clothing for utility, railroad, highway and other outdoor workers to protect them from wind, rain, sleet and snow. Included are light-weight, water-proof fabric jackets and suits; wool jackets; rubber or neoprene suits, overalls, hats, coats, boots and pacs. John E. Dorsey Company, 570 E. First St., Boston 27, Mass.

15. Neoprene Soles and Heels: Literature describes and pictures neoprene soles that are particularly suitable for industrial shoes, because of their resistance to heat, oil and chemicals and their slip-resistance characteristics. Quabaug Rubber Company, North Brookfield, Mass.

16. Sound Absorbers: Illustrated bulletin describes easily installed portable sound absorbing devices that can be used in noisy areas to decrease the sound level. Bulletin shows the box-like device suspended from the ceiling in a machine tool area. Elof Hansson, Inc., Acoustical Dept., 711 Third Ave., New York 17, N. Y.

17. Impregnated Salt Tablets: A bulletin that shows how salt tablets combat heat fatigue encountered by workers in high-temperature occupations or during hot weather. Bulletin emphasizes the impregnation process which permits the tablet to dissolve slowly to prevent nausea. United States Safety Service Company, 1215 McGee St., Kansas City, Mo.

18. Self-Contained Breathing Equipment: A well illustrated folder giving detailed information on the self-contained Air-Pak for fire fighting and industrial respiratory safety. Featured is a large detailed drawing of the equipment with data on the various parts. Scott Aviation Corporation, 211 Erie St., Lancaster, N. Y.

19. Fire Resistant Hydraulic Fluid: To help you determine the fire risk in your plant, this manufacturer has made available a supply of Hydraulic Fluid Survey Sheets — a simple, easy-to-use form for making an objective measurement of your fire risks. The sheet provides a helpful guide to realizing just how many fire risks actually exist in your plant. Monsanto Chemical Company, Organic Chemicals Div. Functional Fluids Dept., St. Louis 1, Mo.

20. Cold Immersion Solvents: A self-emulsifying and self-scouring solvent for decarbonizing engines and components is described in this bulletin. It gives full data on function and uses of the cold immersion solvent, method of use, and precautions. Curran Corporation, Lawrence, Mass.

21. Skin Protection: Illustrated brochure describes and suggests uses for several types of industrial skin protection products, including waterless cleaners; light, medium and heavy duty protective cream; and work lotions. The Chemical Corporation, 54 Waltham Ave., Springfield 9, Mass.

22. Safety Handrift: This bulletin describes a malleable metal drift that retains its shape and will not chip, flake, spark or lose its head. A cut-away drawing shows the Flex-Flo Construction which gives the tool its unique characteristics. Custanite Corporation, 1228 Utica Ave., Brooklyn 3, N. Y.

23. Safeguards for Punch Presses: A pull-back type of guard that pulls the punch press operator's hands out of the danger zone and offers protection if the press repeats, is described in this bulletin. The bulletin shows how the devices contact design requires no column in the aisle and how excessive pull-back of the hand is avoided. SafeGuard Manufacturing Co., Transylvania Road, Woodbury, Conn.

24. "What Do We Mean by Safety Solvents?" Brochure gives complete technical characteristics of standard SAFE-Tee Solvents. Two types of safer solvents, slow and fast drying liquid designed to clean electrical and equipment parts are described. Features emphasized include high flash-point, minimized toxicity, dermatitis freedom, corrosion freedom and ability to remove grease and oil without damage to surfaces of materials of construction. Fine Organics Inc., 211 E. 19th St., New York 3, N. Y.

25. "Color Dynamics": Detailed in this booklet is a plan for making the best use of color in industrial painting. The general rule is about the use of color begin the literature, the various highlighting and relaxing uses of color to prevent eye strain in industry continue the story, and the psychological values of proper colors and painting finish the editorial material. Illustrated in several colors, the booklet also suggests colors of paint to buy and describes the use of color in safety. Pittsburgh Plate Glass Company, Paint Div., Pittsburgh 22, Pa.

26. "The Correct Wire Rope for Contractors' Equipment": By means of photographs and drawings with reeving diagrams, a new brochure lists the proper wire rope specifica-

tions for all types of construction equipment. Included is a discussion of Lang Lay vs. Regular Lay rope, rope constructions and proper wire rope to use for clamshell bucket operation. Macwhyte Company, Kenosha, Wisc.

27. Air Exhaust Muffler: Literature describes the "Auto Muffler," a muffler for air-operated equipment, and features a new four-port deflector which, combined with an internal acoustical resonator gives uniform air dispersement with more effective impingement, resulting in better noise cancellation and improved air flow. A newly engineered disseminator with improved air flow characteristics permits greater volume air flow, thus maintaining equipment operating efficiency. Allied Witan Company, Inc., 12500 Bellair Road, Cleveland, Ohio.

28. Fume Collectors: Welding fumes and other irritating fumes can be eliminated from your plant by use of one of the many styles of fume collectors which are described and illustrated in Bulletin No. 37 E.—Ruemlin Mfg. Co., 3885 N. Palmer St., Milwaukee 12, Wisc.

29. Portable Hot Food and Liquid Carriers: Application of "AerVoid" stainless steel vacuum-insulated food containers to speed mass feeding is described and illustrated in this free literature kit. How these portable hot food and liquid carriers can solve in-plant feeding problems is shown. Vacuum Can Co., 19 S. Hoyne Ave., Chicago 12, Ill.

30. Portable Elevating Trucks: A new catalog, HE-56, describes company's line of fork and platform elevating trucks. The line includes drum stackers and straddle models. Maximum loads range from 1,000 pounds for the pedal-operated models to 1,500 pounds for the battery-powered type. Standard models lift as high as 96 inches. Manufacturer states that every effort has been made to make these trucks rugged, dependable, easily handled and safe. American Pulley Company, 4200 Wissahickon Ave., Philadelphia 29, Pa.

31. Safety Belts: Safety belts and harnesses, are part of the array of industrial safety equipment featured in catalog 56. Leather holsters and complete linemen's equipment are also presented. W. M. Bashlin Company, Grove City 3, Pa.

32. Audiometric Room: Hearing tests, unless conducted under rigid conditions, have no value in law suits. To be sure you conduct these all important tests under just the right environmental conditions, get the scoop on Audiometric Testing Rooms, described in this brochure, which will tell you what you need to know. Koppers Company, Inc., Metal Products Division, Industrial Sound Control Dept., 7603 Scott St., Baltimore 3, Md.

33. Welding Shields: Welders curtains and tarpaulins are described in this bulletin. Flexible, self standing welding shields provide ready "on-the-spot" protection to property and personnel from flash-hot chip-arc-splash-sparks-flying abrasives, etc. Fabricated of top heavy weight duck with welded galvanized wire fabric insert. Easily rolled and carried from job to job. Frommelt Industries, Box 165, Dubuque, Iowa.

34. Safety Clothing: Catalog illustrates heat resistant safety garments made of asbestos, leather and fireproof duck. Featured are gloves, spats, helmets, masks, coats, pants, aprons, suits, overshoes, curtains, etc. Holcomb Safety Garment Company, 118 N. Jefferson St., Chicago 6, Ill.

35. Non-Slip Surfaces: Abrasive rolled steel floor plate which furnishes non-slip surfaces, even on steep inclines, is described and illustrated in this booklet. Several applications are given, as well as technical information and specifications. Alan Wood Steel Co., Conshohocken, Pa.

36. Safety Messages: Tested safety messages put in your employees' hands several times a day can help bring about more "Safety Consciousness" and reduce accidents. One way to get your safety messages across is to use imprinted paper cups, discussed in a folder received from manufacturer. United States Envelope Company, Springfield 2, Mass.

37. Safety Cans: Catalog illustrates and describes company's line of safety cans, which come in many sizes and styles, are usable wherever explosive or flammable liquids are handled or stored. The literature describes the specific application of each type of can. Eagle Manufacturing Co., Wellsburg, West Virginia.

38. Noise Reduction: A sound barrier that's retractable is described in material available from manufacturer. Picture shows how the curtains are used to isolate machine and production noises. Transwall Coated Products, Bemis Bro. Bag Co., 610 - 4th St., South, Minneapolis 15, Minn.

39. Washfountains and Showers: Sanitary washing facilities such as washfountains and multi-stall showers which require fewer piping connections and lower installation cost are described and illustrated in catalog 5601. Details on the simplicity of installation are included. Bradley Washfountain Company, 2237 W. Michigan St., Milwaukee 1, Wisc.

40. Safety Electrical Equipment: Protective portable lighting equipment which eliminates hazards of sparks, shock, broken bulbs (thereby reducing chance of fire) is described and illustrated in this catalog 53-N. Also featured are attachment plugs, sockets and connector bodies, heavy duty rubber cord sets and extension lights. Ericson Mfg. Co., 5209 Euclid Ave., Cleveland 3, Ohio.

41. Combustible Gas Protection: Four types of combustible gas protective instruments are described in this folder; portable indicator, portable audible alarm and two types of combustible gas alarms for fixed locations. The folder illustrates the models, outlines the operation, lists accessories, shows typical users, gives full specifications. Johnson-Williams, Inc., Palo Alto 2, Calif.

42. Emergency Stretchers: Catalog illustrates and describes company's line of emergency stretchers specially designed for first-aid use and which fold for easy storage. Featured are: station wagon conversion cot and stretcher kits, cots and stretchers for first-aid rooms or hospital requirements. The stretchers are made of aluminum, and have rubber bottoms. Washington Products Co., 238 S. Fayette St., Washington C. H., Ohio.

43. Eye-Washing Fountains: Chemical splashes and fires will cause fewer personal injuries if your plant is equipped wtih eye-washing fountains and emergency showers. Literature gives full details on this equipment, and features a saf-t-bag for handling of glass bottles. Benson and Associates, Inc., P. O. Box 7542, Chicago 80, Ill.

44. Barricade Tapes: Literature describes a strong barricade tape principally designed to warn personnel away from radioactive areas, or wherever personnel may be exposed to danger. The tape can be strung across an open doorway or between posts without other backing. The tape has a magenta stripe running through a white background and is made of durable saran non-stretch plastic. The tapes are

also available in a variety of colors, such as black stripe on yellow, etc. Brenton Equipment Co., 374 Brannan Street, San Francisco 7, Calif.

45. Floor Cleaning: Eight-page folder illustrates and describes a new single brush Hilboy Floor Machine that scrubs, polishes, steel wools, sands and grinds. The new low center of gravity gives better balance, easier control — new convenience of handling. Available in 21 inch and 17 inch models. Hillyard, St. Joseph, Mo.

46. "Three N" Brand Illuminized Fabric: New safety garments made of illuminized fabric are featured in this bulletin. Included are illustrations and descriptions of coats, aprons, gloves, etc. Minnesota Mining and Mfg. Co., Dept. NK-47, St. Paul 6, Minn.

47. Everything for Safety: This catalog offers a comprehensive line of safety clothing, equipment and devices, including face shields, welding helmets, protective creams, goggles, machine guards, fire equipment, ladders, etc. In short, everything for safety. Boyer-Campbell Company, 6544 St. Antoine, Detroit 2, Mich.

48. Safety Signs: Signs and tags for accident prevention are presented in this full-color catalog. The many types of signs are printed in the different colors available and with the many messages which can be imprinted over or under the main eye-catching word. Complete specifications and prices are also included. Standard Signs, Inc., 3190 E. 65th St., Cleveland 27, Ohio.

49. Safety Catalog: Catalog illustrates and describes company's line of electric lanterns and safety cans. It includes valuable data: the world's first comprehensive table of lamp and battery operating information. Features high power search lights, all-purpose hand lights, safety lights and lanterns, flammable liquid safety cans and oily waste cans. Justrite Mfg. Co., 2061 N. Southport Ave., Chicago, Ill.

50. Emergency Lights: Complete catalog of portable lights, lights for emergency vehicles, and lights which operate when main source of power fails. Specifications given and approval by Underwriters' Laboratories indicated. Carpenter Mfg. Co., 302 Bradley St., Somerville 45, Mass.

51. Anti-Fatigue Mat: Bulletin describes a Lifetime Rubber Stand-Ease" mat specifically designed to relieve body muscular tiredness and to provide a safe, non-skid area while standing at work. The raised surfaces on both sides keep the feet out of grimy, messy liquids and dirt that remain on the floor. Accident hazards and personal injuries are sharply reduced by its non-skid, gripping, safety construction, according to mfg. Keaton Rubber Co., Kearny, N. J.

52. Washroom Survey Cards: A complete and concise record of washroom maintenance is provided by Washroom Survey Cards now available from manufacturer. The cards enable the man in charge of maintenance to inspect the washroom equipment and make a comprehensive record in a minimum of time. He makes a recommendation for each item of washroom equipment and supplies by placing a check mark in the appropriate column. The complete card is designed to provide an inspector with sufficient information to undertake the work of improving conditions. Made pocket-size, the card also has space for the inspector's comments and recommendations. Bobrick Dispensers, Inc., Dept. NN, 1214 Nostrand Ave., Brooklyn 25, N. Y.

53. Indian Fire Pumps: New catalog describes company's line of Indian Fire Pumps, for extinguishing class A fires. The fire pump is available in two model No. 90 model (sliding pump type) and the No. 80 model (lever type pump and handle). Both types are approved by Underwriters' Laboratories and each has a five gallon tank air conditioned to prevent dampness reaching the back of person using the extinguisher. D. B. Smith & Co., Utica 2, New York.

54. Precision Unit Fire Detectors: A new four-page illustrated brochure on unit fire detectors is now available from manufacturer. The detectors described are the hermetically-sealed Detect-A-Fire units, which operate on a unique rate-compensation principle developed by Fenwal. The brochure describes the various horizontal and vertical models available, states physical and electrical specifications, gives listings and approvals, and offers mounting suggestions for various types of installations. Fenwal, Inc., Ashland, Mass.

55. Pocket Battery Buying Guide: "So You're Going to Buy an Industrial Battery" is the title of a new 16-page illustrated reference booklet (GB-1788). A four-point program for battery users describes the importance of selecting the proper battery for the job, the purpose of correct charging and handling, reasons for systematic maintenance and the value of a continuing knowledge of battery condition. Three case histories demonstrate the value of correct application engineering in handling battery problems. A condensed description of Gould's "Battery Maintenance Schools" is given, as well as information on Gould's Plus-Performance Plan for achieving maximum life and performance from an industrial battery. Gould-National Batteries, Inc., Trenton, N. J.

56. Anti-Skid Coating: Bulletin describes a easy-to-apply Anti-Skid Coating that provides a non-slip surface on concrete, steel or wood for maximum safety on stair steps, floors, ramps, decks and catwalks. Applies easily, can be sprayed or troweled on. Comes in four colors—black, green, terra cotta, and gray. Daubert Chemical Co., Anti-Skid Engineering Division, 333 N. Michigan Ave., Chicago 1, Ill.

57. Industrial Vacuum Cleaning Systems: An eight-page brochure AA-100 describes stationary vacuum cleaning systems for the removal of all sorts of dust, with a detailed description of the systems and their accessories, as supplied by manufacturer. Complete with a breakdown of the savings and advantages of the systems, plus a description of the engineering services available to those with plant problems of sanitation, quality control and production costs. United States Hoffman Machinery Corporation, 103 Fourth Ave., New York 5, N. Y.

58. Sprayable Non-Slip Container Treatment: A new reference file for corrugated container manufacturers and shippers of packaged goods in the food, brewing, oil, glassware, home products and other shipping-container-using industries, describes company's sprayable non-slip container coating No. 1715. The coating permits the stacking of smooth-top containers for in-plant handling or over-the-road shipment without danger of their toppling from pallet, conveyor or truck. The file contains a new 1957 revision of the Paisley Laboratory Report on the product (full of technical fact on the characteristics and use of the product) as well as a four-page illustrated analysis of the techniques and benefits enjoyed by one of the nation's largest motor-oil producing companies. Paisley Products, Inc., 630 W. 51st St., New York, N. Y.

No. 740-R portable lamp guard, with Neoprene handle and Neoprene weatherproof socket with 100-watt Neoprene-covered insulated guard.

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. . . the Reader Service Postcard will get it for you FAST!

Here's how it works—

Printed below are two identical Reader Service postcards—the bottom one for your use; the top one for later readers of this issue. The numbers listed on each card are keyed to product advertised and the new safety equipment and trade publications described on pages 182 through 195. Just circle the items you want to know more about, and we will ask the manufacturer to send you full information without obligation. Both cards are perforated for easy removal, and no postage is required.

New Safety Equipment

Products featured in this section have been carefully reviewed by Council engineers so as to bring you only what's new and reliable in the safety field. Only new safety and health products, or newsworthy improvements in existing equipment are eligible for listing.

Trade Publications

Here's a wealth of helpful trade literature—catalogs, spec sheets, booklets, brochures—that will help you compare before you buy. Whether you are in the market now, or think you may be at a later date, you'll want these valuable references in your safety equipment data file.

Products Advertised

As you read through this issue of the NEWS, you will find advertisements describing equipment that may help you solve some of your accident problems. Instead of making a "mental note," make sure you get full information by circling the corresponding page number on the Reader Service postcard. The letters L, R, T and B locate the ads on the page—left, right, top and bottom. IFC—inside front cover; IBC—inside back cover; BC—back cover.

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The advertising pages of the News

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The advertising policy of the NEWS requires that all equipment and products meet established codes and standards, have the approval of recognized testing agencies, or have proven their value through actual use in industry. Council engineers and technicians screen every advertisement to make sure that product description is accurate, and performance claims verified by reliable sources. It should not be construed, however, that products advertised are approved or endorsed by the National Safety Council.

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Before you mail your Reader Service postcard . . .

TAKE ANOTHER LOOK AT

- **the ADVERTISING pages**
- **the NEW SAFETY EQUIPMENT section**
- **the TRADE PUBLICATION section**

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National Safety News, May, 1957

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5115 Diversey

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3700 Perkins Avenue

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DALLAS, TEXAS
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3570 Flaxley Drive

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Averill Equipment Company
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HOUSTON, TEXAS
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Safety, Incorporated
17 E. 31st Street

KNOXVILLE, TENN.
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832 W. Main Avenue

LOS ANGELES, CALIF.
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MILWAUKEE, WIS.
Universal Safety Equipment Co.
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NEW YORK, N. Y.
(See ORANGE, N. J.)

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(New York-New Jersey Area)

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Standard Industrial Products Co.
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Spokane Safety Appliance Co.
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Safety Equipment S. A.
Sullivan - 95

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CHICAGO EYE SHIELD COMPANY
2306 Warren Boulevard
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Gloves and Mittens are

Hand Protection for Welders

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Leather patch on back of hand gives added protection against sparks and molten metal. Thumb and first finger reinforced with leather patch. Additional reinforcing leather patch around thumb. Full gauntlet. Clute style. Overall length 14".

SCTX200 GLOVE
Gunn style 14" overall length. Flat double stitched seam at base of palm. One-piece back. Wing thumb. Lightweight for working ease.

SC5X163 GLOVE
Offers top resistance to heat on heaviest gas welding and heaviest amperage electric welding. One-piece back and palm. Welted at all vulnerable seams for extra protection. Heavy lining on back. Overall length 14".

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These Hand Protection products are made to the same high quality standards as American Optical Eye Protection equipment. They're RIGHT — in leather quality, thickness, length and construction. For American Optical gloves, only selected, specially chrome tanned cowhide splits are used that meet American Optical's rigid standards for maximum wear, heat-resistance, flexibility and comfort.

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All gloves are bound at cuffs with cotton tape. Mittens while not *specially* chrome tanned are made of a heavier grade cowhide. Four of the ten products in the line are illustrated.

Always insist on
Ⓐ Trademarked Safety Products

American Optical
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SAFETY PRODUCTS DIVISION

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BRANCHES IN PRINCIPAL CITIES